

PRO Series™ Elite

Portable Radios Detailed Service Manual



DOCUMENT HISTORY

The following major changes have been implemented in this manual since the previous edition:

Edition	Description	Date
6881094C21-O	Initial edition	Dec. 2001
6881094C21-B	Added changes from FMR2027-1 into manual. Added Full keypad (FKP) controller board, schematics and parts lists (PCB no.8471678L01). Added Limited keypad (LKP) controller board, schematics and parts lists (PCB no.8471679L01). Added VHF Main Board, Controls and Switches, Receiver, Synthesizer, VCO and Transmitter Diagrams, Parts List (PCB no. 8471021L01) Added UHF Band 1 Main Board, Controls and Switches, Receiver, Synthesizer, VCO and Transmitter Diagrams, Parts List (PCB no. 8471441L01). Added UHF Band 2 Main Board, Controls and Switches, Receiver, Synthesizer, VCO and Transmitter Diagrams, Parts List (PCB no. 8471475L01). Added new universal controller flexes (PCB no. 8471612L01 and 8471698L01). Updated model charts for UHF Band 1, UHF Band 2 and VHF to include IP67 radios.	Jan. 2007

Notes

PRODUCT SAFETY AND RF EXPOSURE COMPLIANCE

**Caution**

Before using this product, read the operating instructions for safe usage contained in the Product Safety and RF Exposure booklet enclosed with your radio.

ATTENTION!

This radio is restricted to occupational use only to satisfy FCC RF energy exposure requirements. Before using this product, read the RF energy awareness information and operating instructions in the Product Safety and RF Exposure booklet enclosed with your radio (Motorola Publication part number 68P81095C98) to ensure compliance with RF energy exposure limits.

For a list of Motorola-approved antennas, batteries, and other accessories, visit the following web site which lists approved accessories: <http://www.motorola.com/cgiss/index.shtml>.

Notes

Table of Contents

Product Safety and RF Exposure Compliance	iii
--	------------

Chapter 1 Introduction	1-1
-------------------------------------	------------

1.1	Scope of Manual	1-1
1.2	Warranty and Service Support.....	1-1
1.2.1	Warranty Period	1-1
1.2.2	Return Instructions.....	1-1
1.2.3	After Warranty Period	1-1
1.3	Related Documents	1-2
1.4	Technical Support.....	1-2
1.4.1	Piece Parts Availability	1-2
1.5	Radio Model Chart and Specifications.....	1-3
1.6	Radio Model Information.....	1-3

Chapter 2 Theory of Operation	2-1
--	------------

2.1	Introduction	2-1
2.2	Radio Power Distribution	2-1
2.3	Keypad.....	2-2
2.4.2	Real Time Clock (RTC).....	2-4
2.4.3	Circuit Description.....	2-4
2.4.4	ModB/Vstby Supply	2-5
2.5	VHF Transmitter	2-5
2.5.2	Antenna Switch	2-6
2.5.3	Harmonic Filter	2-6
2.5.4	Antenna Matching Network.....	2-6
2.5.5	Power Control Integrated Circuit (PCIC).....	2-6
2.5.6	VHF Receiver	2-7
2.5.7	Receiver Front-End.....	2-7
2.5.8	Receiver Back-End	2-8
2.5.9	Automatic Gain Control Circuit	2-8
2.5.10	Frequency Generation Circuitry.....	2-9
2.5.11	Synthesizer	2-10
2.5.12	Voltage Controlled Oscillator (VCO)	2-11
2.6	UHF Transmitter (Band 1 and Band 2).....	2-12
2.6.1	Power Amplifier.....	2-13
2.6.2	Antenna Switch	2-13
2.6.3	Harmonic Filter	2-13
2.6.4	Antenna Matching Network.....	2-13
2.6.5	Power Control Integrated Circuit (PCIC).....	2-13
2.6.6	UHF Receiver (Band 1 and Band 2)	2-14
2.6.7	Receiver Front-End.....	2-14
2.6.8	Receiver Back-End	2-15
2.6.9	Automatic Gain Control Circuit	2-15
2.6.10	Frequency Generation Circuitry.....	2-16
2.6.11	Synthesizer	2-16
2.6.12	Voltage Controlled Oscillator - (VCO).....	2-18

Chapter 3 Maintenance 3-1

3.1	Introduction	3-1
3.2	Preventive Maintenance	3-1
3.2.1	Inspection.....	3-1
3.2.2	Cleaning.....	3-1
3.3	Safe Handling of CMOS and LDMOS.....	3-2
3.4	General Repair Procedures and Techniques.....	3-2
3.5	Shields	3-3
3.6	Recommended Test Tools.....	3-4
3.7	Replacing the Circuit Board Fuse.....	3-6
3.8	Removing and Reinstalling the Circuit Board	3-8
3.9	Error Codes.....	3-8
3.10	VHF Troubleshooting Charts	3-10
	Troubleshooting Flow Chart for Controller	3-10
	Troubleshooting Flow Chart for Receiver (Sheet 1 of 2).....	3-11
	Troubleshooting Flow Chart for Receiver (Sheet 2 of 2).....	3-12
	Troubleshooting Flow Chart for Transmitter.....	3-13
	Troubleshooting Flow Chart for Synthesizer	3-14
	Troubleshooting Flow Chart for VCO	3-15
3.11	UHF (Band 1 and Band 2) Troubleshooting Charts	3-16
	Troubleshooting Flow Chart for Controller	3-16
	Troubleshooting Flow Chart for Receiver (Sheet 1 of 2).....	3-17
	Troubleshooting Flow Chart for Receiver (Sheet 2 of 2).....	3-18
	Troubleshooting Flow Chart for Transmitter.....	3-19
	Troubleshooting Flow Chart for Synthesizer	3-20
	Troubleshooting Flow Chart for VCO	3-21
3.12	Keypad Troubleshooting Chart	3-22

Chapter 4 Schematic Diagrams, Overlays, and Part Lists 4-1

4.1	Introduction	4-1
4.1.1	Notes For All Schematics and Circuit Boards	4-1
4.2	RF - Controller Interconnect Flex.....	4-2
4.2.1	Plain	4-2
4.2.2	Keypad.....	4-2
4.2.3	Schematic for RF - Controller Interconnect Flex.....	4-3
4.2.4	Parts List for Keypad-Controller Interconnect Flex	4-3
4.2.5	Universal Connector Flex Plain.....	4-4
4.2.6	Universal Connector Flex Keypad	4-6
4.2.7	Schematic for Universal Connector Flex Plain.....	4-8
4.2.8	Parts List for Universal Connector Flex Plain	4-8
4.2.9	Parts List for Universal Connector Flex Plain (For Flex No. 8471612L01)	4-8
4.2.10	Schematic for Universal Connector Flex Keypad	4-9
4.2.11	Parts List for Universal Connector Flex Keypad	4-9
4.2.12	Parts List for Universal Connector Flex Keypad (For Flex 8471698L01).....	4-9
5.1	Controller Board Diagrams	5-1
6.1	VHF Circuit Board/ Schematic Diagrams and Parts List.....	6-1
	VHF Radio Parts List.....	6-9
6.2	VHF Circuit Board/ Schematic Diagrams and Parts List (PCB No. 8471021L01)	6-13
	Parts List for VHF (for PCB No. 8471021L01)	6-22
7.1	UHF Band 1, Circuit Board/Schematic Diagrams and Parts List	7-1

UHF Band 1 Radio Parts List.....	7-9
7.2 UHF Band 1, Circuit Board/ Schematic Diagrams and Parts List (PCB No. 8471441L01).....	7-11
UHF Band 1 Radio Parts List (PCB No. 8471441L01)	7-20
8.1 UHF Band 2, Circuit Board/Schematic Diagrams and Parts List	8-1
UHF Band 2 Radio Parts List.....	8-9
8.2 UHF Band 2, Circuit Board/Schematic Diagrams and Parts List (PCB No.8471475L01).....	8-11
UHF Band 2 Radio Parts List (PCB No. 8471475L01)	8-20

Notes

Chapter 1 Introduction

1.1 Scope of Manual

This manual is intended for use by service technicians familiar with similar types of equipment. It contains service information required for the equipment described and is current as of the printing date. Changes that occur after the printing date are incorporated by a complete manual revision or alternatively, as additions.

NOTE Before operating or testing these units, please read the Safety Information Section in the front of this manual.

1.2 Warranty and Service Support

Motorola offers long term support for its products. This support includes full exchange and/or repair of the product during the warranty period, and service/repair or spare parts support out of warranty. Any “return for exchange” or “return for repair” by an authorized Motorola dealer must be accompanied by a warranty claim form. Warranty claim forms are obtained by contacting customer service.

1.2.1 Warranty Period

The terms and conditions of warranty are defined fully in the Motorola dealer or distributor or reseller contract. These conditions may change from time to time and the following notes are for guidance purposes only.

1.2.2 Return Instructions

In instances where the product is covered under a “return for replacement” or “return for repair” warranty, a check of the product should be performed prior to shipping the unit back to Motorola. This is to ensure that the product has been correctly programmed or has not been subjected to damage outside the terms of the warranty.

Prior to shipping any radio back to a Motorola warranty depot, please contact the appropriate customer service for instructions. All returns must be accompanied by a warranty claim form, available from your customer services representative. Products should be shipped back in the original packaging, or correctly packaged to ensure no damage occurs in transit.

1.2.3 After Warranty Period

After the Warranty period, Motorola continues to support its products in two ways:

Firstly, Motorola's Accessories and Aftermarket Division (ADD) supplies individual parts and modules that can be purchased by dealers who are technically capable of performing fault analysis and repair.

Secondly, Motorola's service department offers a repair service to both end users and dealers at competitive prices.

1.3 Related Documents

The following documents are directly related to the use and maintainability of this product.

Title	Part Number
Service Manual, Basic, Engl, NA	68P81094C00
Service Manual, Basic, Engl, LA	68P81094C01
Service Manual, Basic, Span	68P81094C02
Service Manual, Basic, Port	68P81094C03
Service Manual, Detailed, Engl	68P81094C21
Service Manual, Detailed, Span	68P81094C22
Service Manual, Detailed, Port	68P81094C23

1.4 Technical Support

Technical support is available to assist the dealer/distributor and self-maintained customers in resolving any malfunction which may be encountered. Initial contact should be by telephone to customer resources wherever possible. When contacting Motorola technical support, be prepared to provide the product model number and the unit's serial number. The contact locations and telephone numbers are located in the Basic Service Manual listed under the Related Documents paragraph of this chapter.

1.4.1 Piece Parts Availability

Some replacement parts, spare parts, and/or product information can be ordered directly. If a complete Motorola part number is assigned to the part, and it is not identified as "Depot ONLY", the part is available from Motorola Accessories and Aftermarket Division (AAD). If no part number is assigned, the part is not normally available from Motorola. If the part number is appended with an asterisk, the part is serviceable by a Motorola depot only. If a parts list is not included, this generally means that no user-serviceable parts are available for that kit or assembly.

Parts Order Entry

7:00 A. M. to 7:00 P. M. (Central Standard Time)
Monday through Friday (Chicago, U. S. A.)

To Order Parts in the United States of America:

1-800-422-4210, or 847-538-8023
1-800-826-1913, or 410-712-6200 (U. S. Federal Government)
TELEX: 280127
FAX: 1-847-538-8198
FAX: 1-410-712-4991 (U. S. Federal Government)
(U. S. A.) after hours or weekends:
1-800-925-4357

To Order Parts in Latin America and the Caribbean:

Please send an email to:
latech1@email.mot.com
Accessories and Aftermarket Division
(United States and Canada)
Attention: Order Processing
1313 E. Algonquin Road
Schaumburg, IL 60196
Accessories and Aftermarket Division
Attention: Latin America and Caribbean

Order Processing

1313 E. Algonquin Road
Schaumburg, IL 60196

Parts Identification

1-847-538-0021 (Voice)
1-847-538-8194 (FAX)

1.5 Radio Model Chart and Specifications

The radio model charts and specifications are located in the Basic Service Manual listed under the Related Documents paragraph of this chapter.

1.6 Radio Model Information

The model number and serial number are located on a label attached to the back of your radio. You can determine the RF output power, frequency band, protocols, and physical packages from these numbers. The example below shows one portable radio model number and its specific characteristics.

Table 1-1. Radio Model Number

Example: LAH38KDC9AA3

	Type of Unit	Model Series	Freq. Band	Power Level	Physical Packages	Channel Spacing	Protocol	Feature Level	Model Revision	Model Package
AA or LA ↑ LA = Motorola Internal Use	H ↑ H = Portable	38	K VHF (136-174MHz)	D 4-5W	C	9 Program- mable	AA Conven- tional	3	A	N
			R UHF1 (403-470MHz)							
			S UHF2 (450-527MHz)				DU LTR	6		

Notes

Chapter 2 Theory of Operation

2.1 Introduction

This section provides a detailed theory of operation for the radio and its components.

2.2 Radio Power Distribution

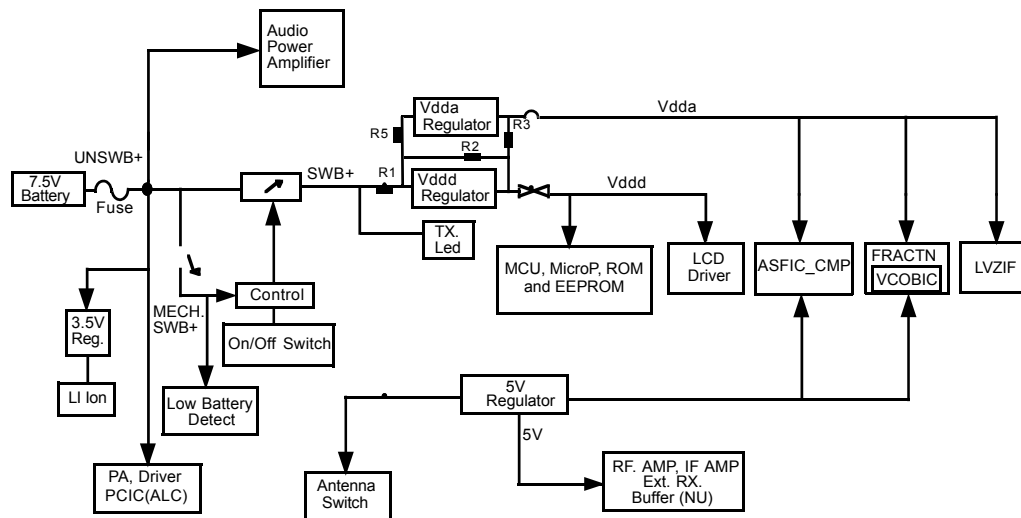


Figure 2-1. DC Power Distribution Block Diagram

A Block diagram of the DC power distribution throughout the radio board is shown in Figure 2-1. A 7.5V battery (BATT 7.5V) supplies power directly to the electronic ON/OFF control as UNSWB+. When the radio is turned on, MECH_SWB+ (ON/OFF volume control) will trigger the electronic ON/OFF control (momentary-on path), then SWB+ is distributed. Vdda from 3.3V Vdda regulator will then supply the microprocessor. Data is then sent to ASFIC_CMP to turn on GCB4(DAC). GCB4 will take over the momentary-on path within 12ms. SWB+ will continue to support the whole board until the radio is turned off.

Radio will be turned-off on two conditions;

1. MECH_SWB+ turned off
2. Low battery

When low battery level is detected by the microprocessor through both conditions above, it will store the radio personality data to EEPROM before turning off.

Table 2-1. Vdd Regulator Band and Radio Jumpers

Jumpers	Dual Vdd Regulator Scheme	Single Vdd Regulator Scheme
R1	Y	Y
R2	N	N
R3	N	Y
R4	N	N
R5	Y	N
Vdda	Y	N
SW. Reg.	N	N

2.3 Keypad

The keypad block diagram is shown in Figure 2-2. The LED_EN setting is set by the codeplug. When the value is set to high, the LED will not light up during power up and vice versa.

U602 is a comparator that will compare the voltage when any one of the keypad row or keypad column keys is being pressed. Therefore when a key is being pressed, it will send a message to the microprocessor through the output (KEY_INT) telling it that a key has been pressed. The microprocessor will then sample the Analog to Digital voltages at the keypad row and keypad column and map it with the table so that the key being pressed can be identified. Once the key has been identified, the message that corresponds to the key will show up at the display.

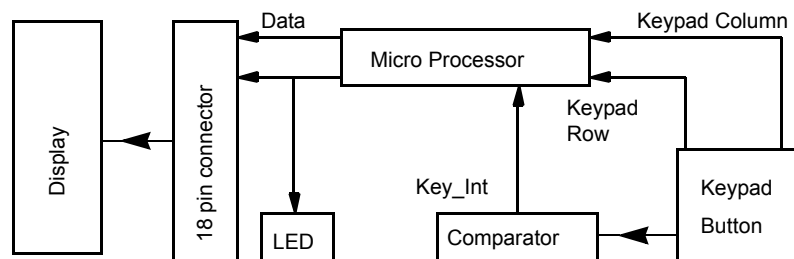


Figure 2-2. Keypad Block Diagram

2.4 Controller Board

The controller board is the central interface between the various subsystems of the radio. It is separated into digital and audio architectures. The digital portion consists of a special Motorola microcontroller (HC11FL0). The audio power amplifier (Audio PA) and audio/signalling/filter/companding IC (ASFIC_CMP) form the backbone of the audio/signalling architecture.

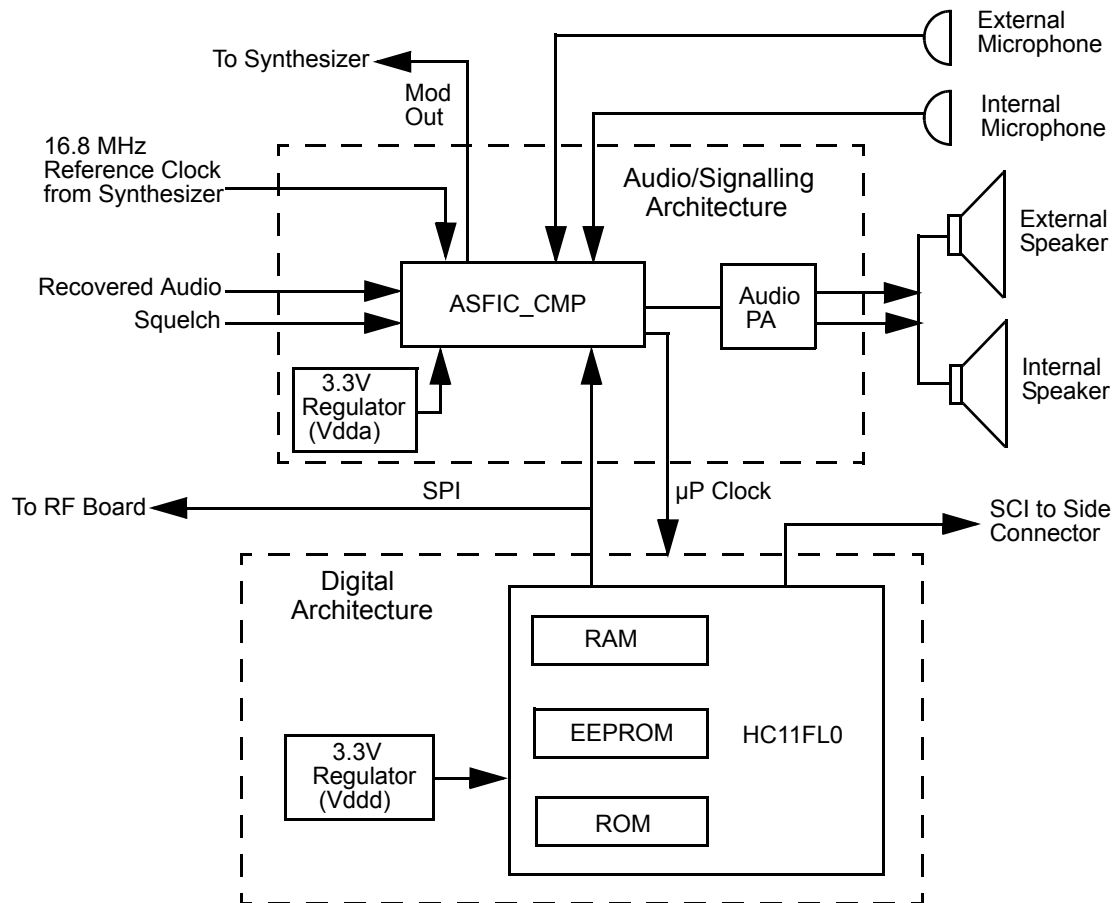


Figure 2-3. Controller Block Diagram

2.4.4 ModB/Vstby Supply

The supply to the ModB/Vstby pin varies depending on the conditions listed in Table 2-2

Table 2-2. ModB/Vstby Supply Modes

Condition	Circuit Operation
Radio On	Vdd supply voltage via CR411
Radio Off	<ul style="list-style-type: none"> • Vdd turned off • Q416 gate is pulled low by R462 • Q416 is switched on • U410 supplies 3.2V to ModB/Vstby
Primary battery removed	<ul style="list-style-type: none"> • Vdd turned off • Q416 gate is pulled low by R462 • Q416 is switched on • Li Ion battery provides 3.2V to ModB/Vstby
Flash Mode	<ul style="list-style-type: none"> • Boot_Ctrl line pull low • ModA & ModB goes low • Processor in boot-strap mode • Flashing enabled

2.5 VHF Transmitter

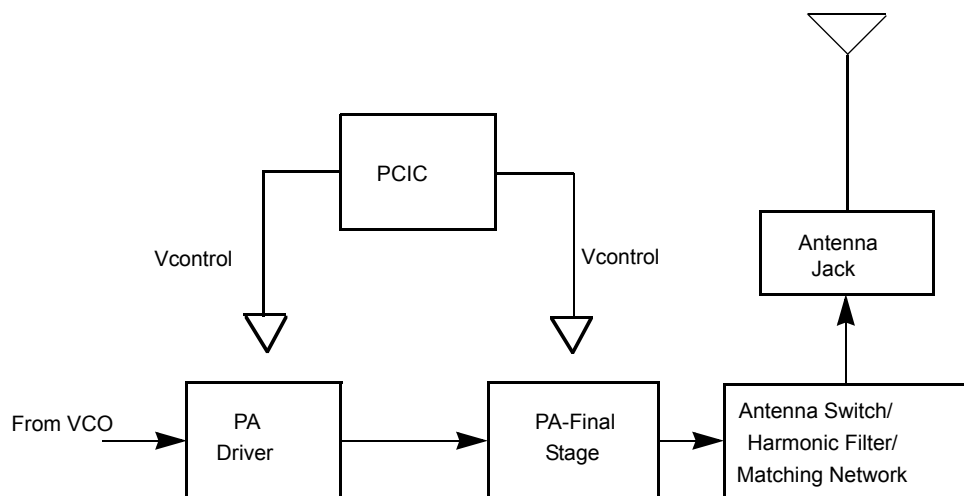


Figure 2-5. Transmitter Block Diagram

The VHF transmitter, shown in Figure 2-5, contains five basic circuits:

- Power Amplifier
- Antenna Switch
- Harmonic Filter
- Antenna Matching Network
- Power Control Integrated Circuit (PCIC).

2.5.1 Power Amplifier

The power amplifier consists of two devices:

- 9Z67 LDMOS driver IC (U3501) and
- PRF1507 LDMOS PA (Q3501).

The 9Z67 LDMOS driver IC contains a 2 stage amplification with a supply voltage of 7.3V.

This RF power amplifier is capable of supplying an output power of 0.3W (pin 6 and 7) with an input signal of 2mW (3dBm) (pin16). The current drain would typically be 130mA while operating in the frequency range of 136-174MHz.

The PRF1507 LDMOS PA is capable of supplying an output power of 7W with an input signal of 0.3W. The current drain would typically be 1800mA while operating in the frequency range of 136-174MHz. The power output can be varied by changing the biasing voltage.

2.5.2 Antenna Switch

The antenna switch circuit consists of two PIN diodes (D3521 and D3551), a pi network (C3531, L3551 and C3550), and three current limiting resistors (R3571, R3572, R3573). In the transmit mode, B+ at PCIC (U3502) pin 23 will go low and turn on Q3561 where a B+ bias is applied to the antenna switch circuit to bias the diodes "on". The shunt diode (D3551) shorts out the receiver port, and the pi network, which operates as a quarter wave transmission line, transforms the low impedance of the shunt diode to a high impedance at the input of the harmonic filter. In the receive mode, the diodes are both off, and hence, there exists a low attenuation path between the antenna and receiver ports.

2.5.3 Harmonic Filter

The harmonic filter consists of C3532 to C3536, L3531 and L3532. This network forms a low-pass filter to attenuate harmonic energy of the transmitter to specifications level. The harmonic filter insertion loss should be less than 1.2dB.

2.5.4 Antenna Matching Network

A matching network which is made up of L3538 and C3537 is used to match the antenna's impedance to the harmonic filter. This will optimize the performance of the transmitter and receiver into an antenna.

2.5.5 Power Control Integrated Circuit (PCIC)

The transmitter uses the Power Control IC (PCIC), U3502 to control the power output of the radio by maintaining the radio current drain. The current to the final stage of the power module is supplied through R3519 (0.1ohms), which provides a voltage proportional to the current drain. This voltage is then feedback to the Automatic Level Control (ALC) within the PCIC to keep the whole loop stable.

The PCIC has internal digital to analog converters (DACs) which provide the reference voltage of the control loop. The voltage level is controlled by the microprocessor through the data line of the PCIC.

There are resistors and integrators within the PCIC, and external capacitors (C3562, C3563 and C3565) in controlling the transmitter rising and falling time. These are necessary in reducing the power splatter into adjacent channels.

U3503 and its associated circuitry acts as a temperature cut back circuitry. This circuitry provides the necessary voltage to the PCIC to cut the transmitter power when the radio temperature gets too high.

2.5.6 VHF Receiver

The VHF receiver consists of a front end, back end, and automatic gain control circuits. A block diagram of the VHF receiver is shown in Figure 2-6. Detailed descriptions of these features are contained in the paragraphs that follow.

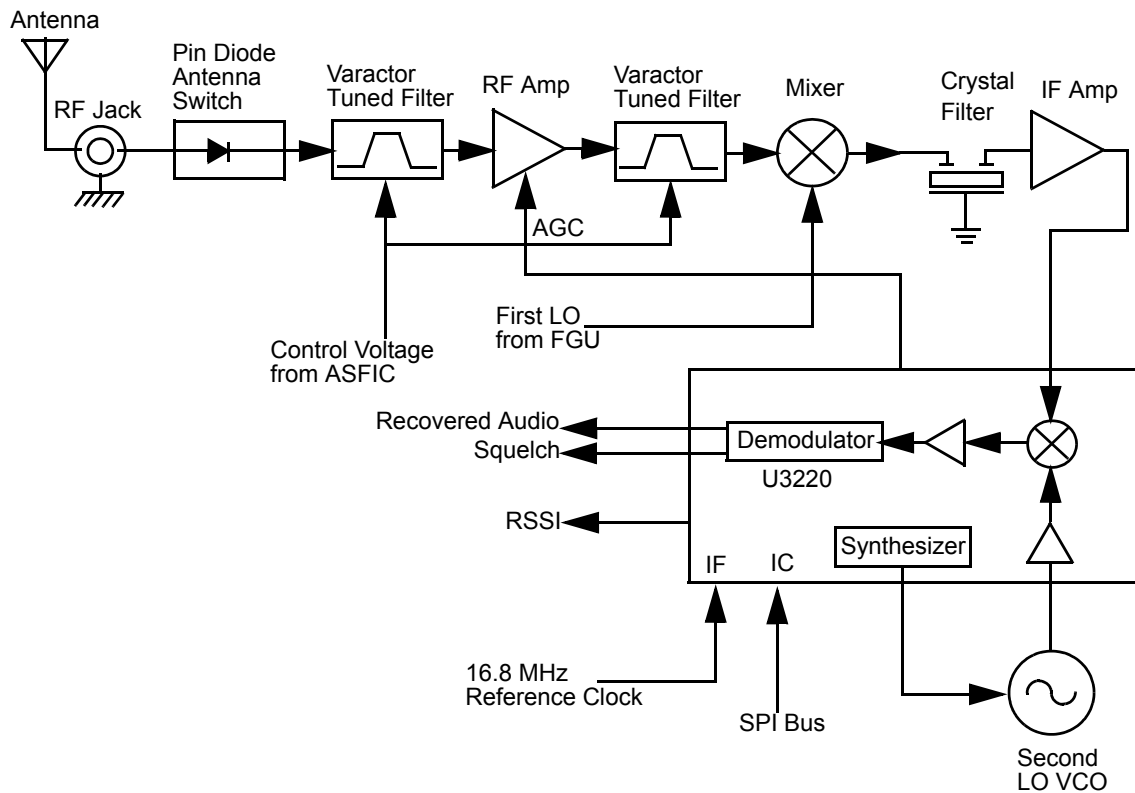


Figure 2-6. VHF Receiver Block Diagram

2.5.7 Receiver Front-End

The RF signal is received by the antenna and applied to a low-pass filter. For VHF, the filter consists of L3531, L3532, C3532 to C3563. The filtered RF signal is passed through the antenna switch. The antenna switch circuit consists of two PIN diodes (D3521 and D3551) and a pi network (C3531, L3551 and C3550). The signal is then applied to a varactor tuned bandpass filter. The VHF bandpass filter comprises of L3301, L3303, C3301 to C3304 and D3301. The bandpass filter is tuned by applying a control voltage to the varactor diode (D3301) in the filter.

The bandpass filter is electronically tuned by the DACRx from IC404 which is controlled by the microprocessor. Depending on the carrier frequency, the DACRx will supply the tuned voltage to the varactor diodes in the filter. Wideband operation of the filter is achieved by shifting the bandpass filter across the band.

The output of the bandpass filter is coupled to the RF amplifier transistor Q3302 via C3306. After being amplified by the RF amplifier, the RF signal is further filtered by a second varactor tuned bandpass filter, consisting of L3305, L3306, C3311 to C3314 and D3302.

Both the pre and post-RF amplifier varactor tuned filters have similar responses. The 3 dB bandwidth of the filter is about 12 MHz. This enables the filters to be electronically controlled by using a single control voltage which is DACRx.

The output of the post-RF amplifier filter is connected to the passive double balanced mixer which consists of T3301, T3302 and CR3301. Matching of the filter to the mixer is provided by C3317, C3318 and L3308. After mixing with the first LO signal from the voltage controlled oscillator (VCO) using high side injection, the RF signal is down-converted to the 45.1 MHz IF signal.

The IF signal coming out of the mixer is transferred to the crystal filter (Y3200) through a resistor pad (R3321 - R3323) and a diplexer (C3320 and L3309). Matching to the input of the crystal filter is provided by C3200 and L3200. The crystal filter provides the necessary selectivity and intermodulation protection.

2.5.8 Receiver Back-End

The output of crystal filter Y3200 is matched to the input of IF amplifier transistor Q3200 by capacitor C3203. Voltage supply to the IF amplifier is taken from the receive 5 volts (R5). The gain controlled IF amplifier provides a maximum gain of about 10dB. The amplified IF signal is then coupled into U3220 (pin 3) via L3202, C3207, and C3230 which provides the matching for the IF amplifier and U3220.

The IF signal applied to pin 3 of U3220 is amplified, down-converted, filtered, and demodulated, to produce the recovered audio at pin 27 of U3220. This IF IC is electronically programmable, and the amount of filtering (which is dependent on the radio channel spacing) is controlled by the microprocessor. Additional filtering, once externally provided by the conventional ceramic filters, is replaced by internal filters in the IF module (U3220).

The IF IC uses a type of direct conversion process, whereby the externally generated second LO frequency is divided by two in U3220 so that it is very close to the first IF frequency. The IF IC (U3220) synthesizes the second LO and phase-locks the VCO to track the first IF frequency. The second LO is designed to oscillate at twice the first IF frequency because of the divide-by-two function in the IF IC.

In the absence of an IF signal, the VCO will “search” for a frequency, or its frequency will vary close to twice the IF frequency. When an IF signal is received, the VCO will lock onto the IF signal. The second LO/VCO is a Colpitts oscillator built around transistor Q3270. The VCO has a varactor diode, D3270, to adjust the VCO frequency. The control signal for the varactor is derived from a loop filter consisting of C3278 to C3280, R3274 and R3275.

The IF IC (U3220) also performs several other functions. It provides a received signal-strength indicator (RSSI) and a squelch output. The RSSI is a dc voltage monitored by the microprocessor, and used as a peak indicator during the bench tuning of the receiver front-end varactor filter. The RSSI voltage is also used to control the automatic gain control (AGC) circuit at the front-end.

The demodulated signal on pin 27 of U3220 is also used for squelch control. The signal is routed to U404 (ASFIC) where squelch signal shaping and detection takes place. The demodulated audio signal is also routed to U404 for processing before going to the audio amplifier for amplification.

2.5.9 Automatic Gain Control Circuit

The front end automatic gain control circuit provides automatic reduction of gain, of the front end RF amplifier via feedback. This action is necessary to prevent overloading of back end circuits. This is achieved by drawing some of the output power from the RF amplifier output. At high radio frequencies, capacitor C3327 provides the low impedance path to ground for this purpose. CR3302 is a PIN diode used for switching the path on or off. A certain amount of forward biasing current is needed to turn the PIN diode on. Transistor Q3301 provides this current.

Radio signal strength indicator, RSSI, a voltage signal, is used to drive Q3301 to saturation i.e. turned on. RSSI is produced by U3220 and is proportional to the gain of the RF amplifier and the input power to the radio.

Resistors R3304 and R3305 are voltage dividers designed to turn on Q3301 at certain RSSI levels. In order to turn on Q3301 the voltage across R3305 must be greater or equal to the voltage across R3324, plus the base-emitter voltage (V_{be}) present at Q3301. Capacitor C3209 is used to dampen any instability while the AGC is turning on. The current flowing into the collector of Q3301, a high current gain NPN transistor, will be drawn through the PIN diode to turn it on. Maximum current flowing through the PIN is limited by the resistors R3316, R3313, R3306 and R3324. C3326 is a feedback capacitor used to provide some stability to this high gain stage.

An additional gain control circuit is formed by Q3201 and its associated circuitry. Resistors R3206 and R3207 are voltage dividers designed to turn on Q3201 at a significantly higher RSSI level than the level required to turn on PIN diode control transistor Q3301. In order to turn on Q3201 the voltage across R3207 must be greater or equal to the voltage across R3208, plus the base-emitter voltage (V_{be}) present at Q3201. As current starts flowing into the collector of Q3201, it reduces the bias voltage at the base of IF amplifier transistor Q3200 and in turn, the gain of the IF amplifier. The gain can be controlled in a range of -30dB up to +10dB.

2.5.10 Frequency Generation Circuitry

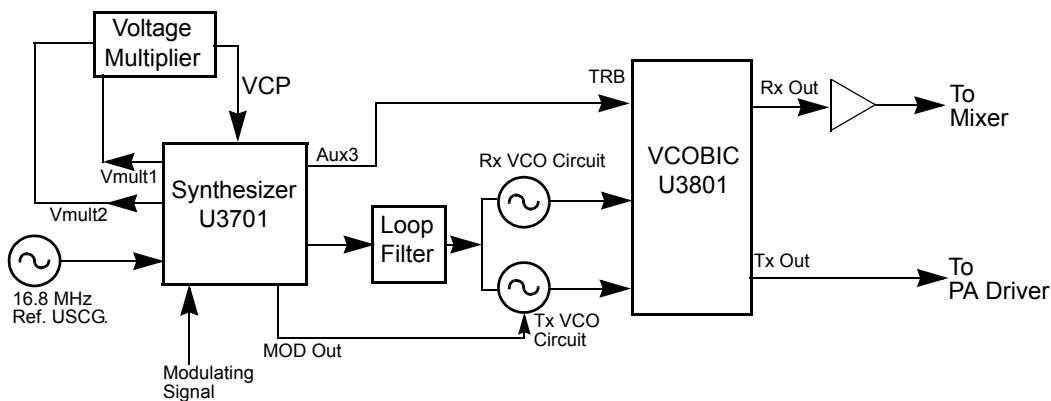


Figure 2-7. Frequency Generation Unit Block Diagram

The Frequency Generation Circuitry, shown in Figure 2-7, is composed of two main ICs, the Fractional-N synthesizer (U3701), and the VCO/Buffer IC (U3801). Designed in conjunction to maximize compatibility, the two ICs provide many of the functions that normally would require additional circuitry. The synthesizer block diagram illustrates the interconnect and support circuitry used in the region. Refer to the relevant schematics for the reference designers.

The synthesizer is powered by regulated 5V and 3.3V which come from U3711 and U3201 respectively. The synthesizer in turn generates a superfiltered 4.5V which powers U3801.

In addition to the VCO, the synthesizer must interface with the logic and ASFIC circuitry. Programming for the synthesizer is accomplished through the data, clock and chip select lines from the microprocessor. A 3.3V dc signal from synthesizer lock detect line indicates to the microprocessor that the synthesizer is locked.

Transmit modulation from the ASFIC is supplied to pin 10 of U3701. Internally the audio is digitized by the Fractional-N and applied to the loop divider to provide the low-port modulation. The audio runs through an internal attenuator for modulation balancing purposes before going out to the VCO.

2.5.11 Synthesizer

The Fractional-N Synthesizer, shown in Figure 2-8, uses a 16.8MHz crystal (Y3761) to provide a reference for the system. The LVFractN IC (U3701) further divides this to 2.1MHz, 2.225MHz, and 2.4MHz as reference frequencies. Together with C3761, C3762, C3763, R3761 and D3761, they build up the reference oscillator which is capable of 2.5ppm stability over temperatures of -30 to 85°C. It also provides 16.8MHz at pin 19 of U3701 to be used by ASFIC and LVZIF.

The loop filter which consist of C3721, C3722, R3721, R3722 and R3723 provides the necessary dc steering voltage for the VCO and determines the amount of noise and spur passing through.

In achieving fast locking for the synthesizer, an internal adapt charge pump provides higher current at pin 45 of U3701 to put synthesizer within the lock range. The required frequency is then locked by normal mode charge pump at pin 43.

Both the normal and adapt charge pumps get their supply from the capacitive voltage multiplier which is made up of C3701 to C3704 and triple diodes D3701, D3702. Two 3.3V square waves (180 deg out of phase) are first multiplied by four and then shifted, along with regulated 5V, to build up 13.5V at pin 47 of U3701.

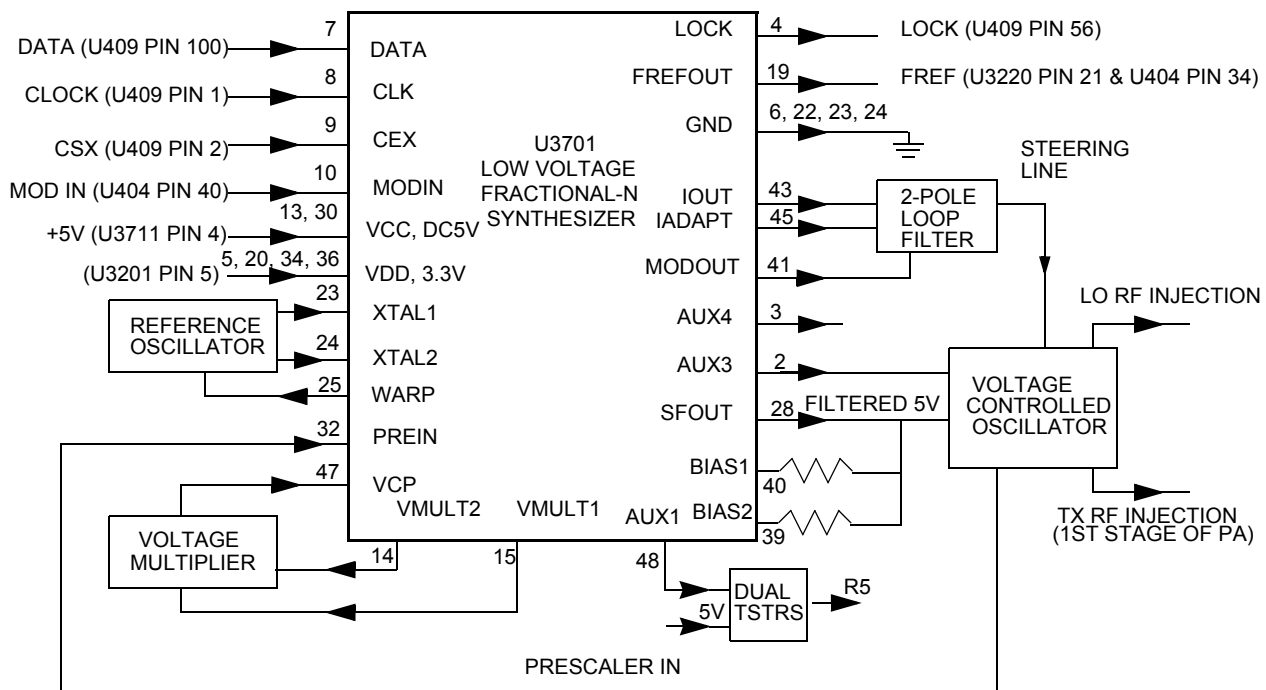


Figure 2-8. Synthesizer Block Diagram

2.5.12 Voltage Controlled Oscillator (VCO)

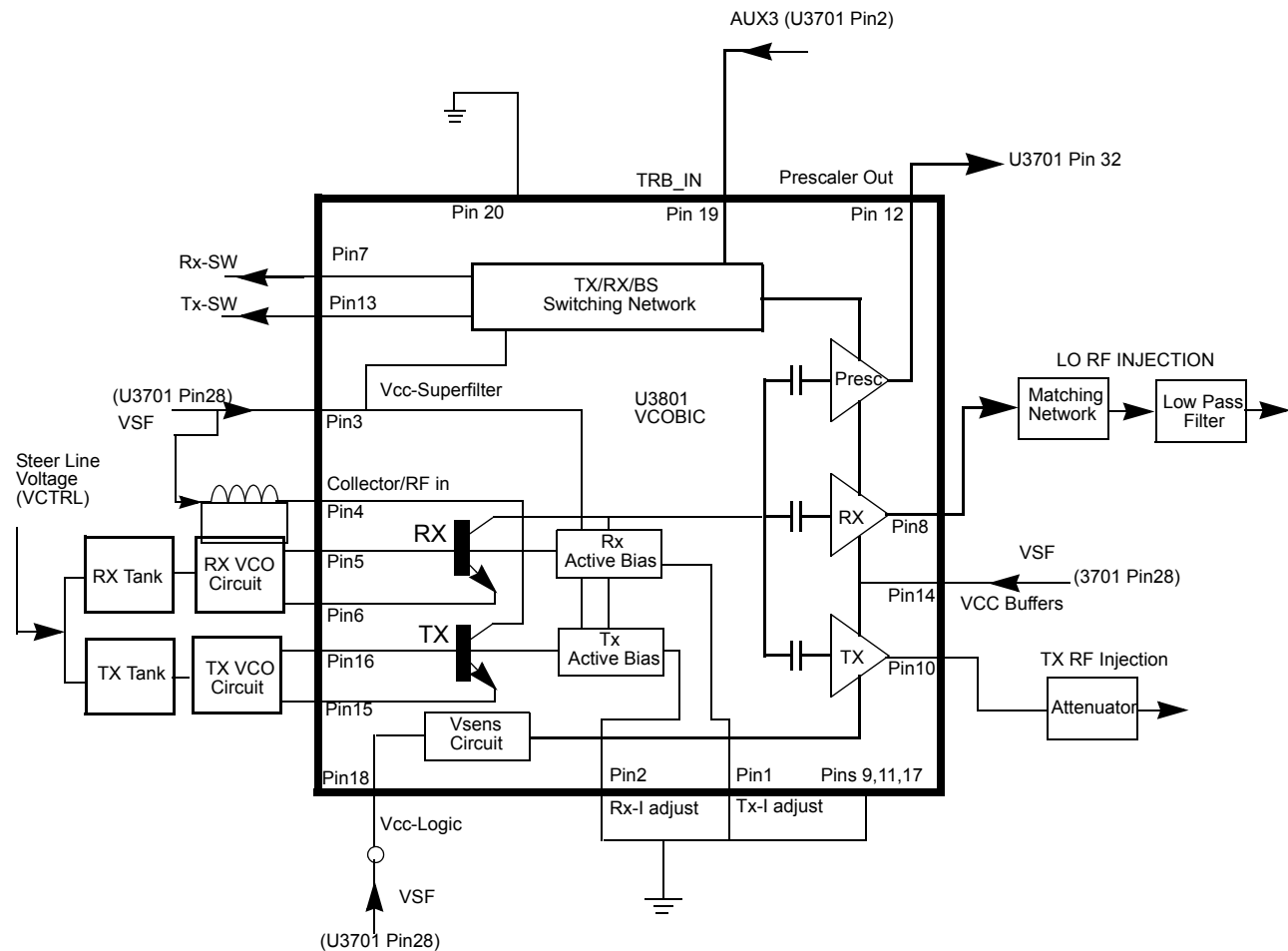


Figure 2-9. VCO Block Diagram

The VCOBIC (U3801), shown in Figure 2-9, in conjunction with the Fractional-N synthesizer (U3701) generates RF in both the receive and the transmit modes of operation. The TRB line (U3801 pin 19) determines which oscillator and buffer will be enabled. A sample of the RF signal from the enabled oscillator is routed from U3801 pin 12, through a low pass filter, to the prescaler input (U3701 pin 32). After frequency comparison in the synthesizer, a resultant CONTROL VOLTAGE is received at the VCO. This voltage is a DC voltage typically between 3.5V and 9.5V when the PLL is locked on frequency.

The RF section of the VCOBIC (U3801) is operated at 4.54 V (VSF), while the control section of the VCOBIC and Fractional-N synthesizer (U3701) is operated at 3.3V. The operation logic is shown in Table 2-3.

Table 2-3. VCO Control Logic

Desired Mode	AUX 4	AUX 3	TRB
Tx	n.u.	High (@3.2V)	High (@3.2V)
Rx	n.u.	Low	Low
Battery Saver	n.u.	Hi-Z/Float (@1.6V)	Hi-Z/Float (@1.6V)

In the receive mode, U3801 pin 19 is low or grounded. This activates the receive VCO by enabling the receive oscillator and the receive buffer of U3801. The RF signal at U3801 pin 8 is run through a matching network. The resulting RF signal is the LO RF INJECTION and it is applied to the mixer at T3302.

During the transmit condition, when PTT is depressed, 3.2 volts is applied to U3801 pin 19. This activates the transmit VCO by enabling the transmit oscillator and the transmit buffer of U3801. The RF signal at U3801 pin 10 is injected into the input of the PA module (U3501 pin16). This RF signal is the TX RF INJECTION. Also in transmit mode, the audio signal to be frequency modulated onto the carrier is received through U3701 pin 41.

When a high impedance is applied to U3801 pin19, the VCO is operating in BATTERY SAVER mode. In this case, both the receive and transmit oscillators as well as the receive transmit and prescaler buffer are turned off.

2.6 UHF Transmitter (Band 1 and Band 2)

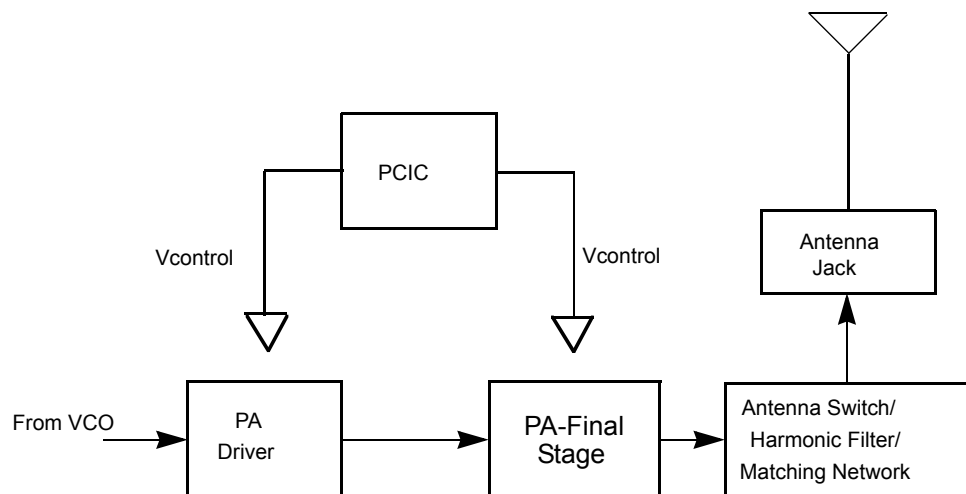


Figure 2-10. Transmitter Block Diagram

The UHF transmitter consists of the following basic circuits as shown in Figure 2-10:

- Power Amplifier
- Antenna Switch
- Harmonic Filter
- Antenna Matching Network
- Power Control Integrated Circuit (PCIC).

2.6.1 Power Amplifier

The power amplifier consists of two devices:

- 9Z67 LDMOS driver IC (U101) and
- PRF1507 LDMOS PA (Q110).

The 9Z67 LDMOS driver IC contains a 2 stage amplification with a supply voltage of 7.3V.

This RF power amplifier is capable of supplying an output power of 0.3W (pins 6 and 7) with an input signal of 2mW (3dBm) (pin 16). The current drain would typically be 160mA while operating in the frequency range of 403-470MHz for Band 1 or 450-527MHz for Band 2.

The PRF1507 LDMOS PA is capable of supplying an output power of 7W with an input signal of 0.3W. The current drain would typically be 1300mA while operating in the frequency range of 403-470MHz for Band 1 or 450-527MHz for Band 2. The power output can be varied by changing the biasing voltage.

2.6.2 Antenna Switch

The antenna switch circuit consists of two PIN diodes (CR101 and CR102), a pi network (C107, L104 and C106), and two current limiting resistors (R101, R170). In the transmit mode, B+ at PCIC (U102) pin 23 will go low and turn on Q111 where a B+ bias is applied to the antenna switch circuit to bias the diodes "on". The shunt diode (CR102) shorts out the receiver port, and the pi network, which operates as a quarter wave transmission line, transforms the low impedance of the shunt diode to a high impedance at the input of the harmonic filter. In the receive mode, the diodes are both off, and hence, there exists a low attenuation path between the antenna and receiver ports.

2.6.3 Harmonic Filter

The harmonic filter consists of C104, L102, C103, L101 and C102. The design of the harmonic filter for UHF is that of a modified Zolotarev design. It has been optimized for efficiency of the power module. This type of filter has the advantage that it can give a greater attenuation in the stop-band for a given ripple level. The harmonic filter insertion loss is typically less than 1.2dB.

2.6.4 Antenna Matching Network

A matching network which is made up of L116 is used to match the antenna's impedance to the harmonic filter. This will optimize the performance of the transmitter and receiver into an antenna.

2.6.5 Power Control Integrated Circuit (PCIC)

The transmitter uses the Power Control IC (PCIC), U102 to regulate the power output of the radio. The current to the final stage of the power module is supplied through R101, which provides a voltage proportional to the current drain. This voltage is then feedback to the Automatic Level Control (ALC) within the PCIC to regulate the output power of the transmitter.

The PCIC has internal digital to analog converters (DACs) which provide the reference voltage of the control loop. The reference voltage level is programmable through the SPI line of the PCIC.

There are resistors and integrators within the PCIC, and external capacitors (C133, C134 and C135) in controlling the transmitter rising and falling time. These are necessary in reducing the power splatter into adjacent channels.

CR105 and its associated components are part of the temperature cut back circuitry. It senses the printed circuit board temperature around the transmitter circuits and output a DC voltage to the PCIC. If the DC voltage produced exceeds the set threshold in the PCIC, the transmitter output power will be reduced so as to reduce the transmitter temperature.

2.6.6 UHF Receiver (Band 1 and Band 2)

The UHF receiver consists of a front end, back end, and automatic gain control circuits. a block diagram of the receiver is shown in Figure 2-11.

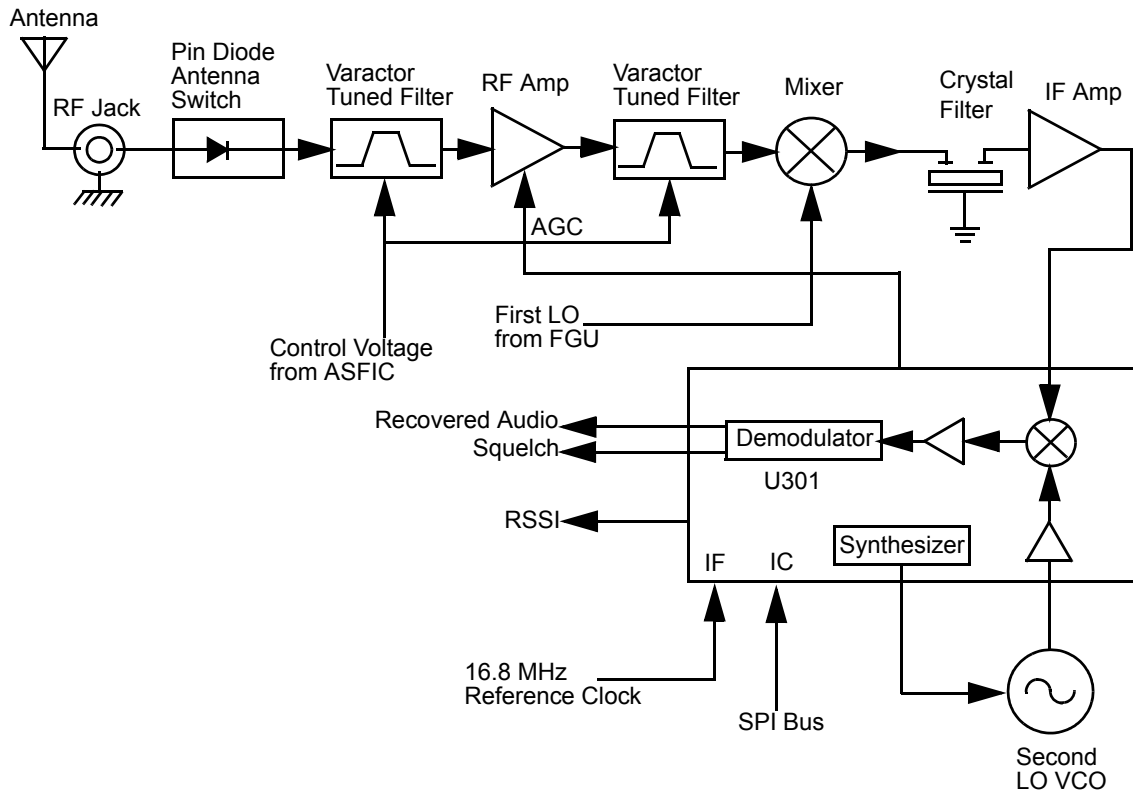


Figure 2-11. UHF Receiver Block Diagram

A detailed description of these stages are contained in the paragraphs that follow.

2.6.7 Receiver Front-End

The RF signal is received by the antenna and applied to a low-pass filter. For UHF, the filter consists of L101, L102, C102, C103, C104. The filtered RF signal is passed through the antenna switch. The antenna switch circuit consists of two PIN diodes (CR101 and CR102) and a pi network (C106, L104 and C107). The signal is then applied to a varactor tuned bandpass filter. The UHF bandpass filter comprises of L301, L302, C302, C303, C304, CR301 and CR302. The bandpass filter is tuned by applying a control voltage to the varactor diodes (CR301 and CR302) in the filter.

The bandpass filter is electronically tuned by the DACRx from IC404 which is controlled by the microprocessor. Depending on the carrier frequency, the DACRx will supply the tuned voltage to the varactor diodes in the filter. Wideband operation of the filter is achieved by shifting the bandpass filter across the band.

The output of the bandpass filter is coupled to the RF amplifier transistor Q301 via C307. After being amplified by the RF amplifier, the RF signal is further filtered by a second varactor tuned bandpass filter, consisting of L306, L307, C313, C317, CR304 and CR305.

Both the pre and post-RF amplifier varactor tuned filters have similar responses. The 3dB bandwidth of the filter is about 50MHz. This enables the filters to be electronically controlled by using a single control voltage which is DACRx.

The output of the post-RF amplifier filter which is connected to the passive double balanced mixer consists of T301, T302 and CR306. Matching of the filter to the mixer is provided by C381. After mixing with the first LO signal from the voltage controlled oscillator (VCO) using low side injection, the RF signal is down-converted to the 45.1MHz IF signal.

The IF signal coming out of the mixer is transferred to the crystal filter (FL301) through a resistor pad and a diplexer (C322 and L310). Matching to the input of the crystal filter is provided by C324 and L311. The crystal filter provides the necessary selectivity and intermodulation protection.

2.6.8 Receiver Back-End

The output of crystal filter FL301 is matched to the input of IF amplifier transistor Q302 by components R352 and C325. Voltage supply to the IF amplifier is taken from the receive 5 volts (R5). The IF amplifier provides a gain of about 7dB. The amplified IF signal is then coupled into U301 (pin 3) via C330, C338 and L330 which provides the matching for the IF amplifier and U301.

The IF signal applied to pin 3 of U301 is amplified, down-converted, filtered, and demodulated, to produce the recovered audio at pin 27 of U301. This IF IC is electronically programmable, and the amount of filtering (which is dependent on the radio channel spacing) is controlled by the microprocessor. Additional filtering, once externally provided by the conventional ceramic filters, is replaced by internal filters in the IF module (U301).

The IF IC uses a type of direct conversion process, whereby the externally generated second LO frequency is divided by two in U301 so that it is very close to the first IF frequency. The IF IC (U301) synthesizes the second LO and phase-locks the VCO to track the first IF frequency. The second LO is designed to oscillate at twice the first IF frequency because of the divide-by-two function in the IF IC.

In the absence of an IF signal, the VCO will “search” for a frequency, or its frequency will vary close to twice the IF frequency. When an IF signal is received, the VCO will lock onto the IF signal. The second LO/VCO is a Colpitts oscillator built around transistor Q320. The VCO has a varactor diode, CR310, to adjust the VCO frequency. The control signal for the varactor is derived from a loop filter consisting of C362, C363, C364, R320 and R321.

The IF IC (U301) also performs several other functions. It provides a received signal-strength indicator (RSSI) and a squelch output. The RSSI is a DC voltage monitored by the microprocessor, and used as a peak indicator during the bench tuning of the receiver front-end varactor filter. The RSSI voltage is also used to control the automatic gain control (AGC) circuit at the front-end.

The demodulated signal on pin 27 of U301 is also used for squelch control. The signal is routed to U404 (ASFIC) where squelch signal shaping and detection takes place. The demodulated audio signal is also routed to U404 for processing before going to the audio amplifier for amplification.

2.6.9 Automatic Gain Control Circuit

The front end automatic gain control circuit is to provide automatic gain reduction of the front end RF amplifier via feedback. This action is necessary to prevent overloading of back end circuits. This is achieved by drawing some of the output power from the RF amplifier's output. At high radio frequencies, capacitor C331 provides the low impedance path to ground for this purpose. CR308 is a PIN diode used for switching the path on or off. A certain amount of forward biasing current is needed to turn the PIN diode on. Transistor Q315 provides this current where upon saturation, current will flow via R347, PIN diode, collector and emitter of Q315 and R319 before going to ground. Q315 is an NPN transistor used for switching here. Maximum current flowing through the PIN is mainly limited by the resistor R319.

Radio signal strength indicator, RSSI, a voltage signal, is used to drive Q315 to saturation hence turning it on. RSSI is produced by U301 and is proportional to the gain of the RF amplifier and the input RF signal power to the radio.

Resistor network at the input to the base of Q315 is scaled to turn on Q315, hence activating the AGC, at certain RSSI levels. In order to turn on Q315, the voltage across the transistor's base to ground must be greater or equal to the voltage across R319, plus the base-emitter voltage (V_{be}) present at Q315. The resistor network with thermistor RT300 is capable of providing temperature compensation to the AGC circuit, as RSSI generated by U301 is lower at cold temperatures compared to normal operation at room temperature. Resistor R300 and capacitor C397 form an R-C network used to dampen any transient instability while the AGC is turning on.

2.6.10 Frequency Generation Circuitry

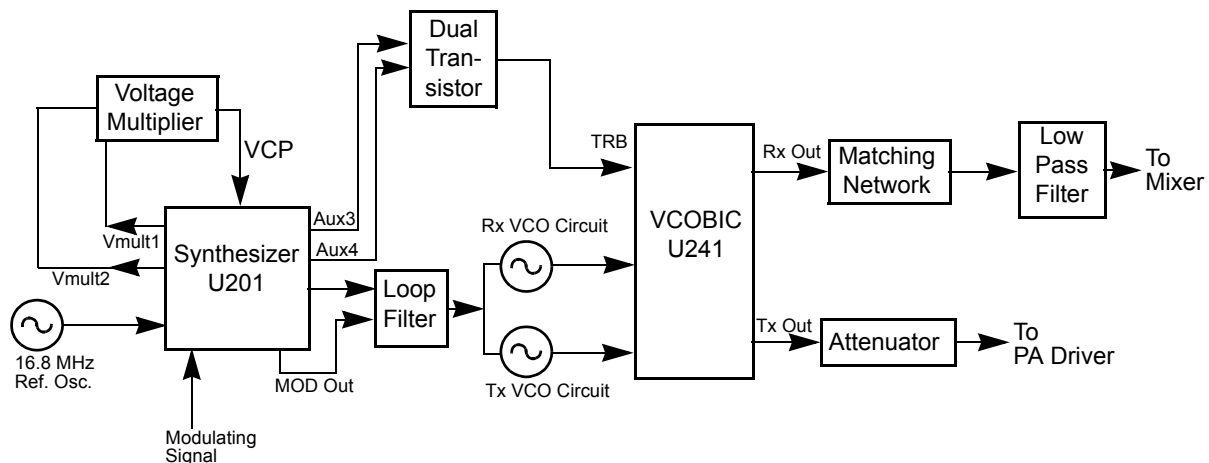


Figure 2-12. Frequency Generation Unit Block Diagram

The Frequency Generation Circuitry is composed of two main ICs, the Fractional-N synthesizer (U201), and the VCO/Buffer IC (U241). Designed in conjunction to maximize compatibility, the two ICs provide many of the functions that normally would require additional circuitry. The synthesizer block diagram illustrates the interconnect and support circuitry used in the region. Refer to the relevant schematics for the reference designators.

The synthesizer is powered by regulated 5V and 3.3V which come from U247 and U248 respectively. The synthesizer in turn generates a superfiltered 4.5V which powers U241.

In addition to the VCO, the synthesizer must interface with the logic and ASFIC circuitry.

Programming for the synthesizer is accomplished through the data, clock and chip select lines from the microprocessor. A 3.3V dc signal from synthesizer lock detect line indicates to the microprocessor that the synthesizer is locked.

Transmit modulation from the ASFIC is supplied to pin10 of U201. Internally the audio is digitized by the Fractional-N and applied to the loop divider to provide the low-port modulation. The audio runs through an internal attenuator for modulation balancing purposes before going out to the VCO.

2.6.11 Synthesizer

The Fractional-N Synthesizer uses a 16.8MHz crystal (FL201) to provide a reference for the system. The LVFractN IC (U201) further divides this to 2.1MHz, 2.225MHz, and 2.4MHz as reference frequencies. Together with C206, C207, C208, R204 and CR203, they build up the reference oscillator which is capable of 2.5ppm stability over temperatures of -30 to 85°C. It also provides 16.8MHz at pin 19 of U201 to be used by ASFIC and LVZIF.

The loop filter which consist of C231, C232, C233, R231, R232 and R233 provides the necessary DC steering voltage for the VCO and determines the amount of noise and spur passing through.

In achieving fast locking for the synthesizer, an internal adapt charge pump provides higher current at pin 45 of U201 to put synthesizer within the lock range. The required frequency is then locked by normal mode charge pump at pin 43.

Both the normal and adapt charge pumps get their supply from the capacitive voltage multiplier which is made up of C258, C259, C228, triple diode CR201 and level shifters U210 and U211. Two 3.3V square waves (180 deg out of phase) are first shifted to 5V, then along with regulated 5V, put through arrays of diodes and capacitors to build up 13.3V at pin 47 of U201.

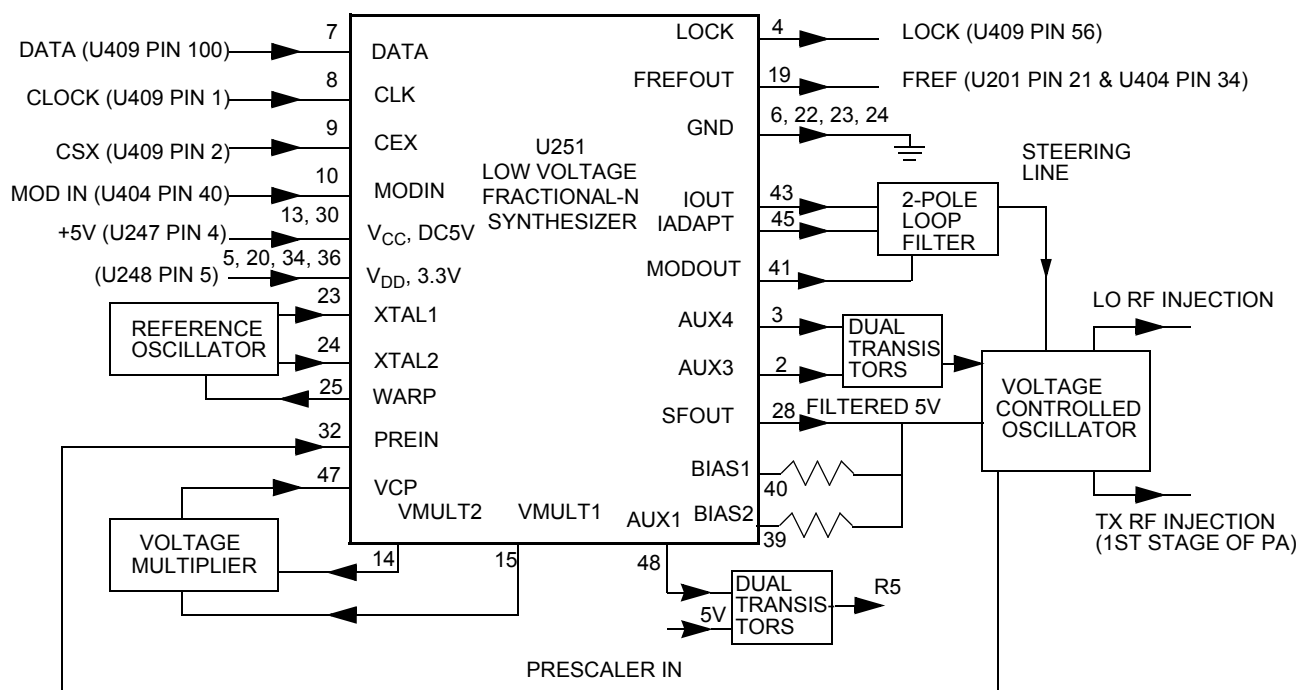


Figure 2-13. Synthesizer Block Diagram

2.6.12 Voltage Controlled Oscillator - (VCO)

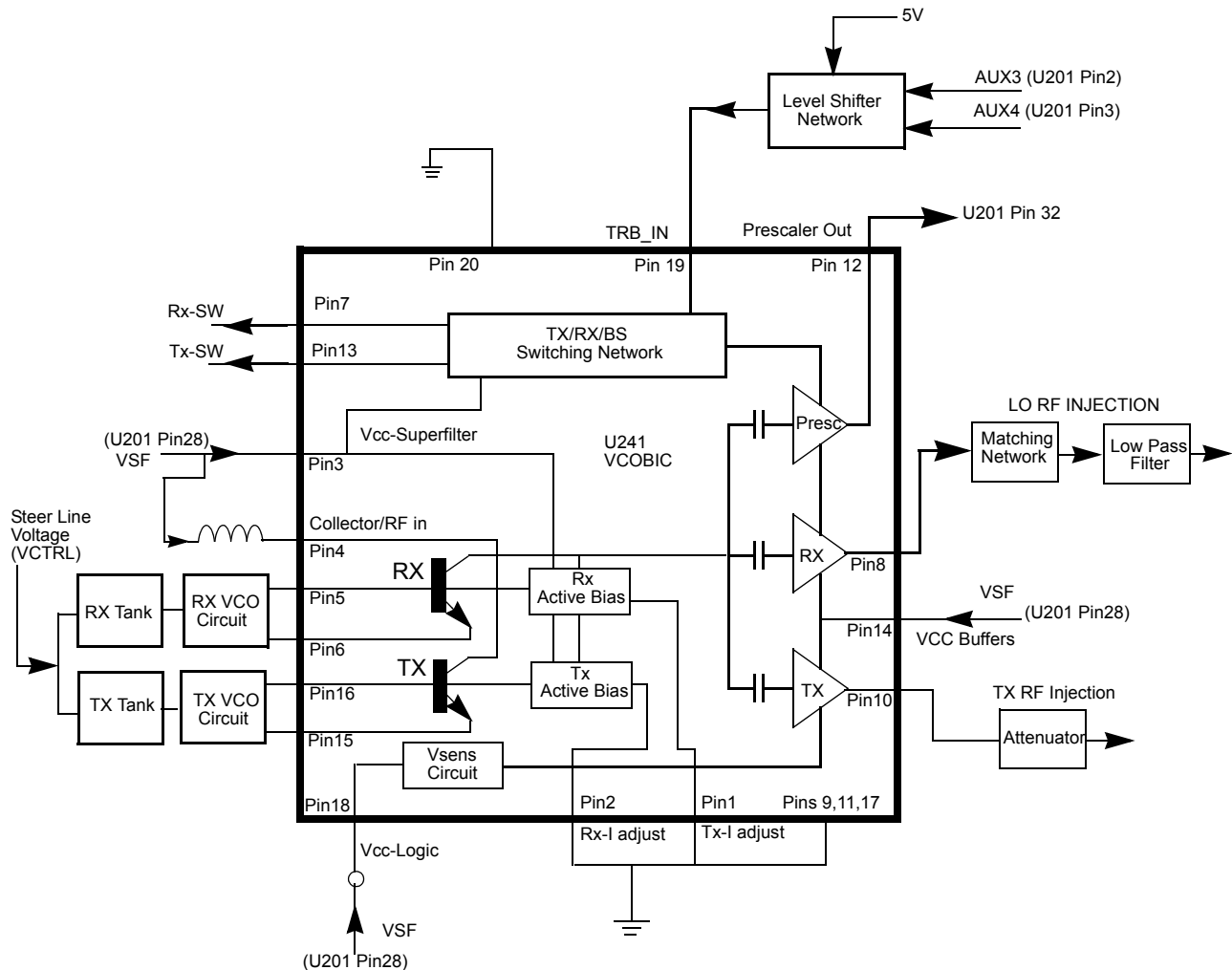


Figure 2-14. VCO Block Diagram

The VCOBIC (U241) in conjunction with the Fractional-N synthesizer (U201) generates RF in both the receive and the transmit modes of operation. The TRB line (U241 pin 19) determines which oscillator and buffer will be enabled. A sample of the RF signal from the enabled oscillator is routed from U241 pin 12, through a low pass filter, to the prescaler input (U201 pin 32). After frequency comparison in the synthesizer, a resultant CONTROL VOLTAGE is received at the VCO. This voltage is a DC voltage between 3.5V and 9.5V when the PLL is locked on frequency.

The VCOBIC(U241) is operated at 4.54V (VSF) and Fractional-N synthesizer (U201) at 3.3V. This difference in operating voltage requires a level shifter consisting of Q260 and Q261 on the TRB line.

The operation logic is shown in Table 2-4.

Table 2-4. Level Shifter Logic

Desired Mode	AUX 4	AUX 3	TRB
Tx	Low	High (@3.2V)	High (@4.8V)
Rx	High	Low	Low
Battery Saver	Low	Low	Hi-Z/Float (@2.5V)

In the receive mode, U241 pin 19 is low or grounded. This activates the receive VCO by enabling the receive oscillator and the receive buffer of U241. The RF signal at U241 pin 8 is run through a matching network. The resulting RF signal is the LO RF INJECTION and it is applied to the mixer at T302.

During the transmit condition, when PTT is depressed, five volts is applied to U241 pin 19. This activates the transmit VCO by enabling the transmit oscillator and the transmit buffer of U241. The RF signal at U241 pin 10 is injected into the input of the PA module (U101 pin16). This RF signal is the TX RF INJECTION. Also in transmit mode, the audio signal to be frequency modulated onto the carrier is received through the U201 pin 41.

When a high impedance is applied to U241 pin19, the VCO is operating in BATTERY SAVER mode. In this case, both the receive and transmit oscillators as well as the receive transmit and prescaler buffer are turned off.

Notes

Chapter 3 Maintenance

3.1 Introduction

This chapter of the manual describes:

- Preventive maintenance
- Safe handling of CMOS devices
- Repair procedures and techniques

3.2 Preventive Maintenance

The radios do not require a scheduled preventive maintenance program; however, periodic visual inspection and cleaning is recommended.

3.2.1 Inspection

Check that the external surfaces of the radio are clean, and that all external controls and switches are functional. It is not recommended to inspect the interior electronic circuitry.

3.2.2 Cleaning

The following procedures describe the recommended cleaning agents and the methods to be used when cleaning the external and internal surfaces of the radio. External surfaces include the front cover, housing assembly, and battery case. These surfaces should be cleaned whenever a periodic visual inspection reveals the presence of smudges, grease, and/or grime.

NOTE Internal surfaces should be cleaned only when the radio is disassembled for servicing or repair.

The only recommended agent for cleaning the external radio surfaces is a 0.5% solution of a mild dishwashing detergent in water. The only factory recommended liquid for cleaning the printed circuit boards and their components is isopropyl alcohol (70% by volume).



CAUTION: The effects of certain chemicals and their vapors can have harmful results on certain plastics. Aerosol sprays, tuner cleaners, and other chemicals should be avoided.

1. Cleaning External Plastic Surfaces

The detergent-water solution should be applied sparingly with a stiff, non-metallic, short-bristled brush to work all loose dirt away from the radio. A soft, absorbent, lintless cloth or tissue should be used to remove the solution and dry the radio. Make sure that no water remains entrapped near the connectors, cracks, or crevices.

2. Cleaning Internal Circuit Boards and Components

Isopropyl alcohol may be applied with a stiff, non-metallic, short-bristled brush to dislodge embedded or caked materials located in hard-to-reach areas. The brush stroke should direct the dislodged material out and away from the inside of the radio. Make sure that controls or tunable components are not soaked with alcohol. Do not use high-pressure air to hasten the drying process since this could cause the liquid to collect in unwanted places. Upon completion of the cleaning process, use a soft, absorbent, lintless cloth to dry the area. Do not brush or apply any isopropyl alcohol to the frame, front cover, or back cover.

NOTE Always use a fresh supply of alcohol and a clean container to prevent contamination by dissolved material (from previous usage).

3.3 Safe Handling of CMOS and LDMOS

Complementary metal-oxide semiconductor (CMOS) and lateral diffusion metal oxide semiconductor (LDMOS) devices are used in this family of radios. Their characteristics make them susceptible to damage by electrostatic or high voltage charges. Damage can be latent, resulting in failures occurring weeks or months later. Therefore, special precautions must be taken to prevent device damage during disassembly, troubleshooting, and repair.

Handling precautions are mandatory for the circuits and are especially important in low humidity conditions. DO NOT attempt to disassemble the radio without first referring to the CMOS CAUTION paragraph in the Disassembly and Reassembly section of the basic manual (See Chapter 3).

3.4 General Repair Procedures and Techniques

1. Parts Replacement and Substitution

When damaged parts are replaced, identical parts should be used. If the identical replacement component is not locally available, check the parts list for the proper Motorola part number and order the component from the nearest Motorola Communications parts center listed in the "Piece Parts" section of this manual (See Chapter 1).

2. Rigid Circuit Boards

The family of radios uses bonded, multi-layer, printed circuit boards. Since the inner layers are not accessible, some special considerations are required when soldering and unsoldering components. The printed-through holes may interconnect multiple layers of the printed circuit. Therefore, care should be exercised to avoid pulling the plated circuit out of the hole.

3. When soldering near the 20-pin and 40-pin connectors:

- avoid accidentally getting solder in the connector.
- be careful not to form solder bridges between the connector pins
- closely examine your work for shorts due to solder bridges.

4. Flexible Circuits

The flexible circuits are made from a different material than the rigid boards and different techniques must be used when soldering. Excessive prolonged heat on the flexible circuit can damage the material. Avoid excessive heat and excessive bending.

5. For parts replacement, use the ST-1087 Temperature-Controlled Solder Station with a 600-700 degree tip, and use small diameter solder such as ST-633. The smaller size solder will melt faster and require less heat to be applied to the circuit.

To replace a component on a flexible circuit:

- grasp the edge of the flexible circuit with seizers (hemostats) near the part to be removed
- pull gently
- apply the tip of the soldering iron to the component connections while pulling with the seizers.
- Do not attempt to puddle out components. Prolonged application of heat may damage the flexible circuit.

6. Chip Components

Use either the RLN-4062 Hot-Air Repair Station or the Motorola 0180381B45 Repair Station for chip component replacement. When using the 0180381B45 Repair Station, select the TJ-65 mini-thermojet hand piece. On either unit, adjust the temperature control to 700 degrees F. (370 degrees C), and adjust the airflow to a minimum setting. Airflow can vary due to component density.

• To remove a chip component:

- Use a hot-air hand piece and position the nozzle of the hand piece approximately 1/8" (0.3 cm) above the component to be removed.

- Begin applying the hot air. Once the solder reflows, remove the component using a pair of tweezers.
- Using a solder wick and a soldering iron or a power desoldering station, remove the excess solder from the pads.
- **To replace a chip component using a soldering iron:**
 - Select the appropriate micro-tipped soldering iron and apply fresh solder to one of the solder pads.
 - Using a pair of tweezers, position the new chip component in place while heating the fresh solder.
 - Once solder wicks onto the new component, remove the heat from the solder.
 - Heat the remaining pad with the soldering iron and apply solder until it wicks to the component. If necessary, touch up the first side. All solder joints should be smooth and shiny.
- **To replace a chip component using hot air:**
 - Use the hot-air hand piece and reflow the solder on the solder pads to smooth it.
 - Apply a drop of solder paste flux to each pad.
 - Using a pair of tweezers, position the new component in place.
 - Position the hot-air hand piece approximately 1/8" (0.3 cm) above the component and begin applying heat.
 - Once the solder wicks to the component, remove the heat and inspect the repair. All joints should be smooth and shiny.

3.5 Shields

Removing and replacing shields will be done with the R-1070 station with the temperature control set to approximately 415°F (215°C) [445°F (230°C) maximum]

- **To remove the shield:**
 - Place the circuit board in the R-1070's holder.
 - Select the proper heat focus head and attach it to the heater chimney.
 - Add solder paste flux around the base of the shield.
 - Position the shield under the heat-focus head.
 - Lower the vacuum tip and attach it to the shield by turning on the vacuum pump.
 - Lower the focus head until it is approximately 1/8" (0.3 cm) above the shield.
 - Turn on the heater and wait until the shield lifts off the circuit board.
 - Once the shield is off, turn off the heat, grab the part with a pair of tweezers, and turn off the vacuum pump.
 - Remove the circuit board from the R-1070's circuit board holder.
- **To replace the shield:**
 - Add solder to the shield if necessary, using a micro-tipped soldering iron.
 - Next, rub the soldering iron tip along the edge of the shield to smooth out any excess solder. Use solder wick and a soldering iron to remove excess solder from the solder pads on the circuit board.
 - Place the circuit board back in the R1070's circuit board holder.
 - Place the shield on the circuit board using a pair of tweezers.
 - Position the heat-focus head over the shield and lower it to approximately 1/8" (0.3 cm) above the shield.
 - Turn on the heater and wait for the solder to reflow.
 - Once complete, turn off the heat, raise the heat-focus head and wait approximately one minute for the part to cool.
 - Remove the circuit board and inspect the repair. No cleaning should be necessary.

3.6 Recommended Test Tools

Table 3-1 lists the tools recommended for working on this family of radios. These tools are also available from Motorola.

Table 3-1. Recommended Test Tools

MotorolaPart Number	Description:	Application:
RSX4043A	Torx Driver	Tighten and remove chassis screws
6680387A70	T-6 Torx Bit	Removable Torx driver bit
R1453A	Digital readout solder station	Digitally controlled soldering iron
RLN4062A	Hot Air Workstation, 120V	Tool for hot air soldering / desoldering of surface mounted integrated circuits.
0180386A78	Illuminated magnifying glass with lens attachment.	
0180302E51	Master Lens System	Illumination and magnification of components
0180386A82	Anti-static grounding kit	Used during all radio assembly and disassembly procedures
6684253C72	Straight prober	
6680384A98	Brush	
1010041A86	Solder (RMA type), 63/37,	0.5mm diameter, 1 lb. spool
0180303E45	SMD tool kit	(included with R1319A)
R1319A (110V) ChipMaster	Surface Mount Removal and assembly of	
R1321A (220V)	surface-mounted integrated circuits and or Rework Station shields. Includes 5 nozzles	
ChipMaster Options		Heat-focus heads for R-1319A work station
6680370B54 0.710" x 0.710"		
6680370B57 0.245" x 0.245"		
6680370B58 0.340" x 0.340"		
6680371B15 0.460" x 0.560"		
ChipMaster Nozzles		ChipMaster Nozzles
6680333E28		PA Nozzle
6680332E83		PLCC-28* Nozzle
6680332E93		PLCC-32 Nozzle
6680332E82		PLCC-44* Nozzle
6680332E94		PLCC-52 Nozzle
6680332E95		PLCC-68* Nozzle
6680332E96		PLCC-84 Nozzle
6680332E89		QFP-80 Nozzle

Table 3-1. Recommended Test Tools

MotorolaPart Number	Description:	Application:
6680332E90		QFP-100* Nozzle
6680332E91		QFP-132* Nozzle
ChipMaster Nozzles		ChipMaster Nozzles
6680334E67		QFP-160 Nozzle
6680332E86		SOIC-14/SOL-16J Nozzle
6680333E46		SOL-18 Nozzle
6680332E84		SOIC-20 Nozzle
6680332E87		SOL-20J Nozzle
6680332E88		SOL-28J Nozzle
6680333E55		TSOP-64 Nozzle
R1364A	Digital Heated Tweezer System Chip component removal	
R1427A	Board Preheater	Reduces heatsink on multi level boards
6680309B53	Rework Equipment Catalog	Contains application notes, procedures and Technical references: Rework Equipment

* Included with Chipmaster packages.

Table 3-2. Recommended Test Equipment

MotorolaPart Number	Description:	Application:
R2600 Series	System Analyzer	Frequency/deviation meter and signal items with an asterisk (*).generator for wide range trouble shooting and alignment.
*R1074A	Fluke 87 Digital	True RMS metering, 200KHz Digital voltmeter is recommended for AC / Multi-meter. frequency counter, 32 segmentDC voltage and current measurements. bargraph w/ backlit display.
*R1377A	AC Voltmeter	1mV to 300V, 10 Mega Ohm Audio voltage measurements input impedance.
R1611A	Dual Channel 100MHz	Two-channel, 100 MHz band- Wave-form Measurements. Oscilloscope (Agilent width 200 M sample rate / sec. and 2Mb memory / channel.

Table 3-2. Recommended Test Equipment

MotorolaPart Number	Description:	Application:
S1339A	RF Milli-Voltmeter	100uV to 3V RF, 10KHz to 1GHzRF level measurements. frequency range.
*R1013B	SINAD Meter	w/o RMS Audio Voltmeter. Receiver Sensitivity Measurements. or *R1370A SINAD Meter w/ RMS w/ RMS Audio Voltmeter. Receiver Sensitivity Measurements.
S1348D	Programmable DC	0-20VDC, 0-5Amps, current Bench Supply for 7.5Vdc. Power Supply limited

3.7 Replacing the Circuit Board Fuse.

In cases where the radio fails to turn on when power is applied, the circuit board fuse should always be checked as a probable cause of the failure. The locations of the fuse for both the UHF and VHF boards are shown in Figure 3-1. The radio must be disassembled to replace the fuses as described in the Basic Service Manual (see Chapter 1 - Related Documents), then the circuit board separated from the radio chassis as described in the paragraphs that follow.

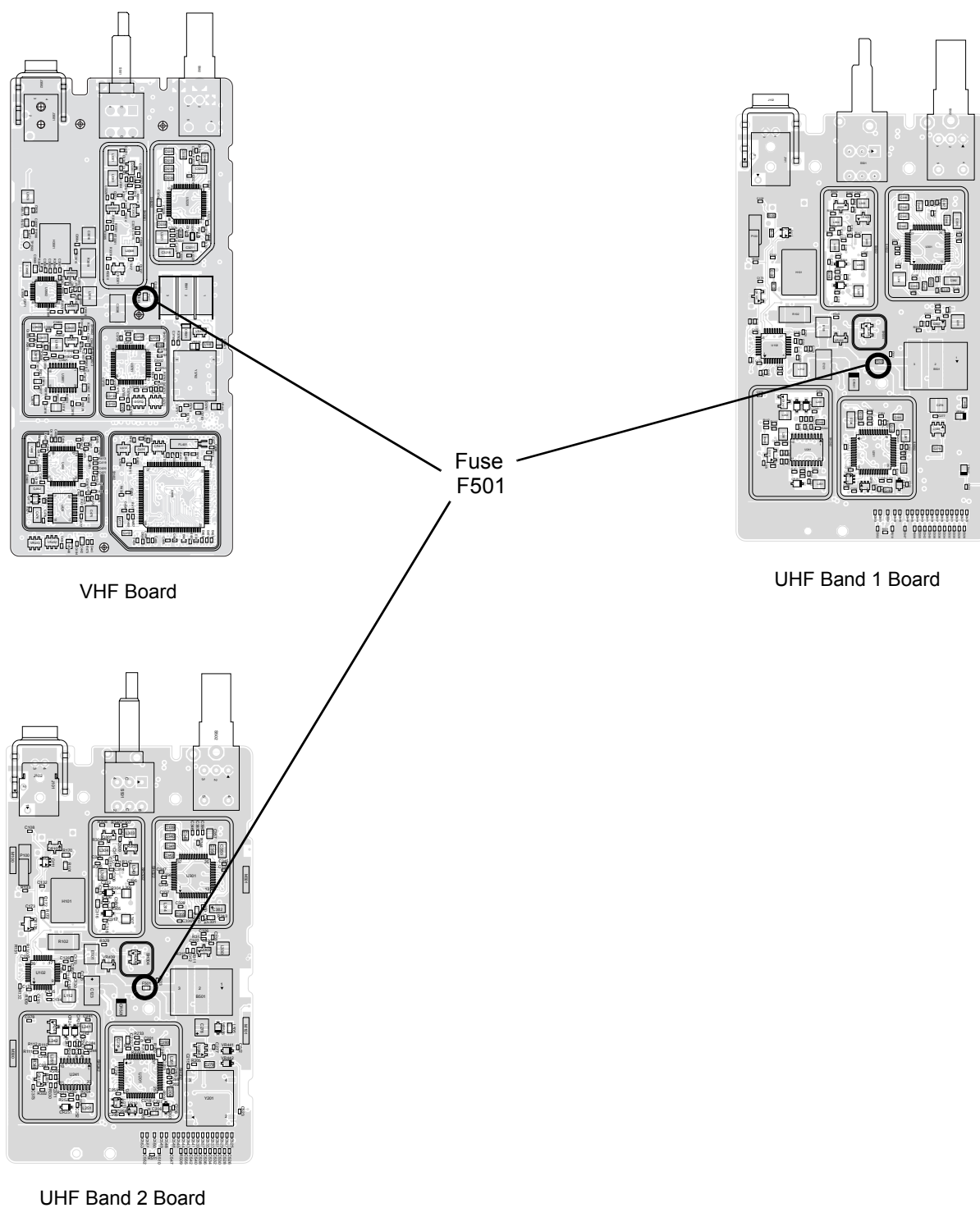


Figure 3-1. VHF, UHF Band 1, and UHF Band 2 Circuit Board Fuse Location

3.8 Removing and Reinstalling the Circuit Board

Both the UHF and VHF circuit boards are removed from the radio chassis in the following manner:

1. Refer to the Basic Service Manual (see Chapter 3- Related Documents) for radio disassembly, then use a philips screwdriver and to remove the four M2X4 screws shown in Figure 3-2.
2. Lift the circuit board out of the radio chassis, then remove and discard the O-rings located between the circuit board and chassis.
3. After repairs, replace the O-rings then reinstall the circuit board into the radio chassis.
4. Reinstall and tighten the four Torx screws to secure the circuit board to the chassis.
5. Refer to the Basic Service Manual to reassemble the radio.

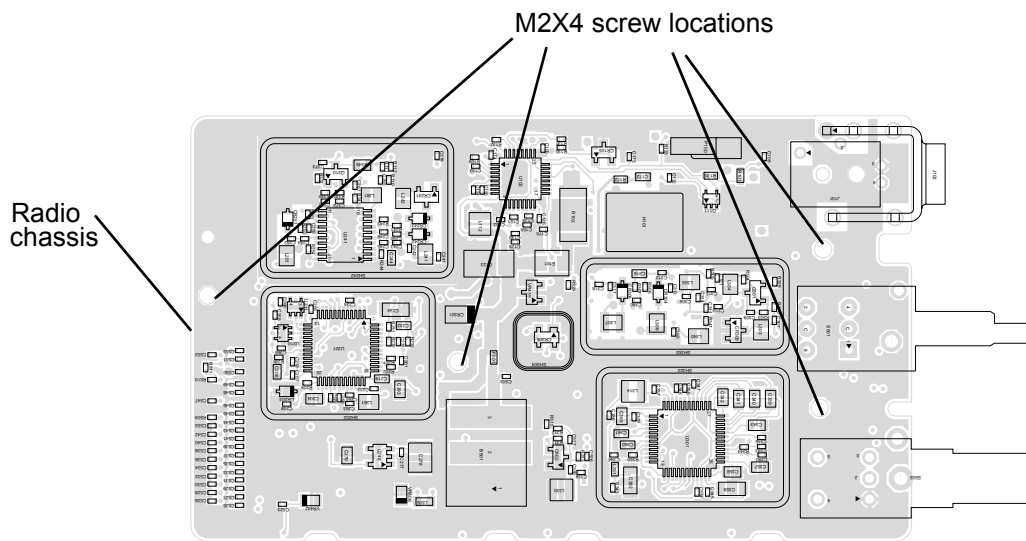


Figure 3-2. Circuit Board Removal and Reinstallation

3.9 Error Codes

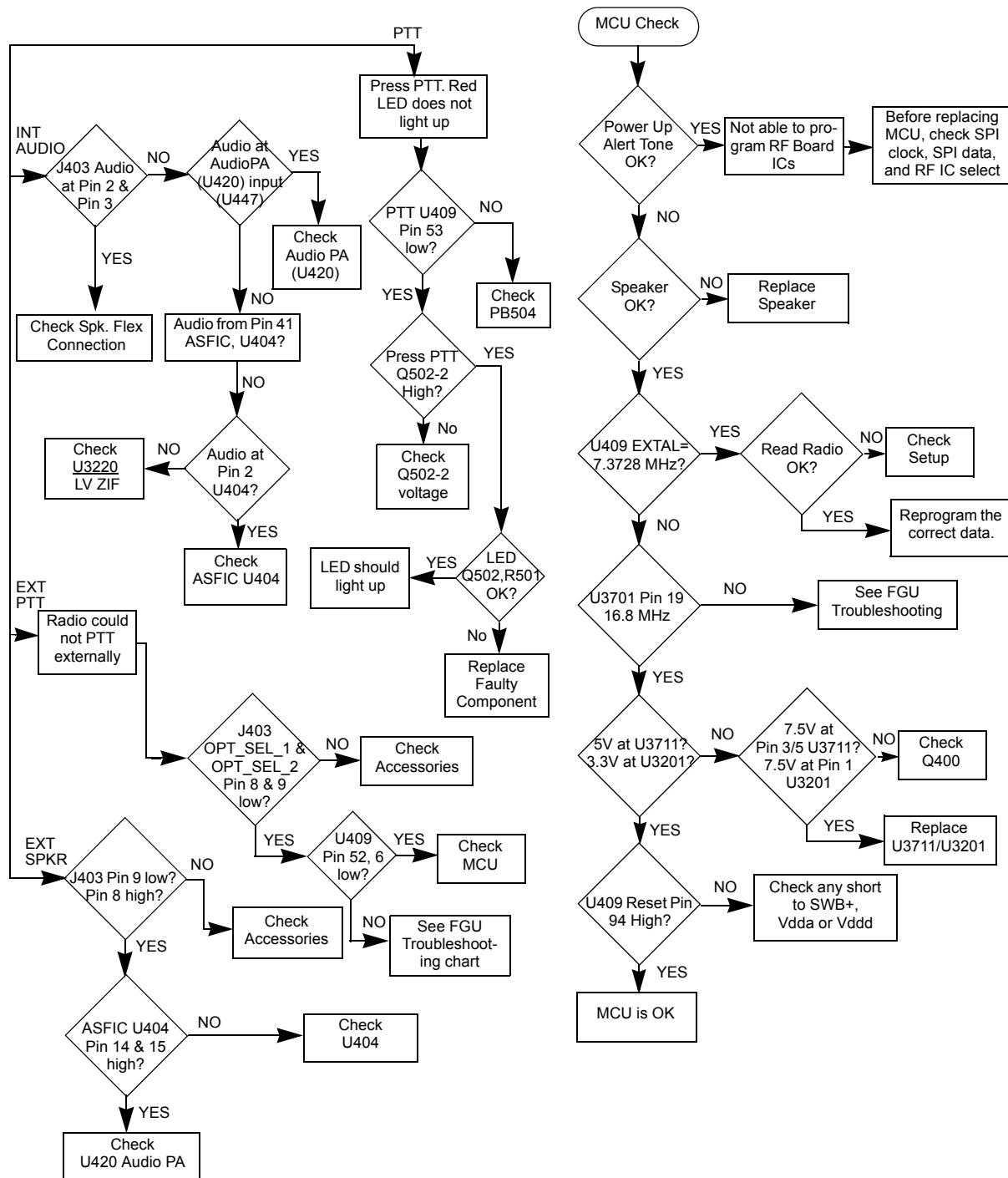
Turning on the radio using the ON/OFF volume control starts a self-test routine which checks the RAM, ROM checksum, EEPROM hardware and EEPROM checksum. If these checks are successfully completed, the radio will generate the Self-Test Pass Tone. Radio emits a low pitch tone if it fails the self-test.

*Error Code	Explanation	Corrective Action
"RAM TST ERROR"	RAM Test Failure	Retest radio by turning it off and turning it on again. If message reoccurs, replace RAM (U405).
"ROM CS ERROR"	ROM Checksum is wrong.	Reprogram FLASH Memory, then retest. If message reoccurs, replace ROM (U406).
"EEPROM HW ERROR"	Codeplug structure mismatch, non existence of codeplug.	Reprogram codeplug with correct version and retest radio. If message reoccurs, replace EEPROM (U407).

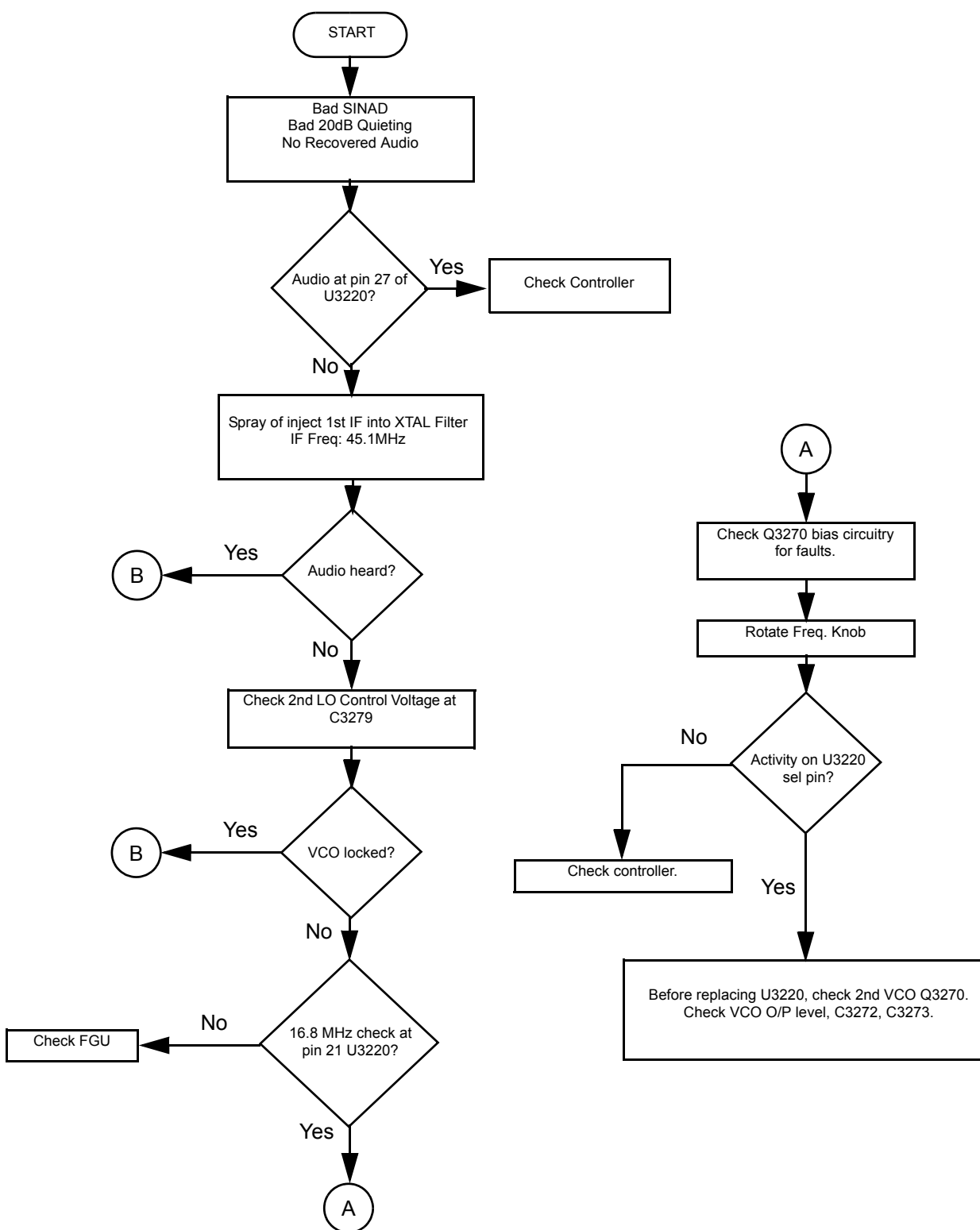
*Error Code	Explanation	Corrective Action
"EEPRM CS ERROR"	Codeplug check-sum is wrong.	Reprogram codeplug.
No Display	Display module is not connected properly. Display module is damaged.	Check connection between main board and display module. Replace with new display module.

NOTE: *Error Codes are displayed on display radios only.

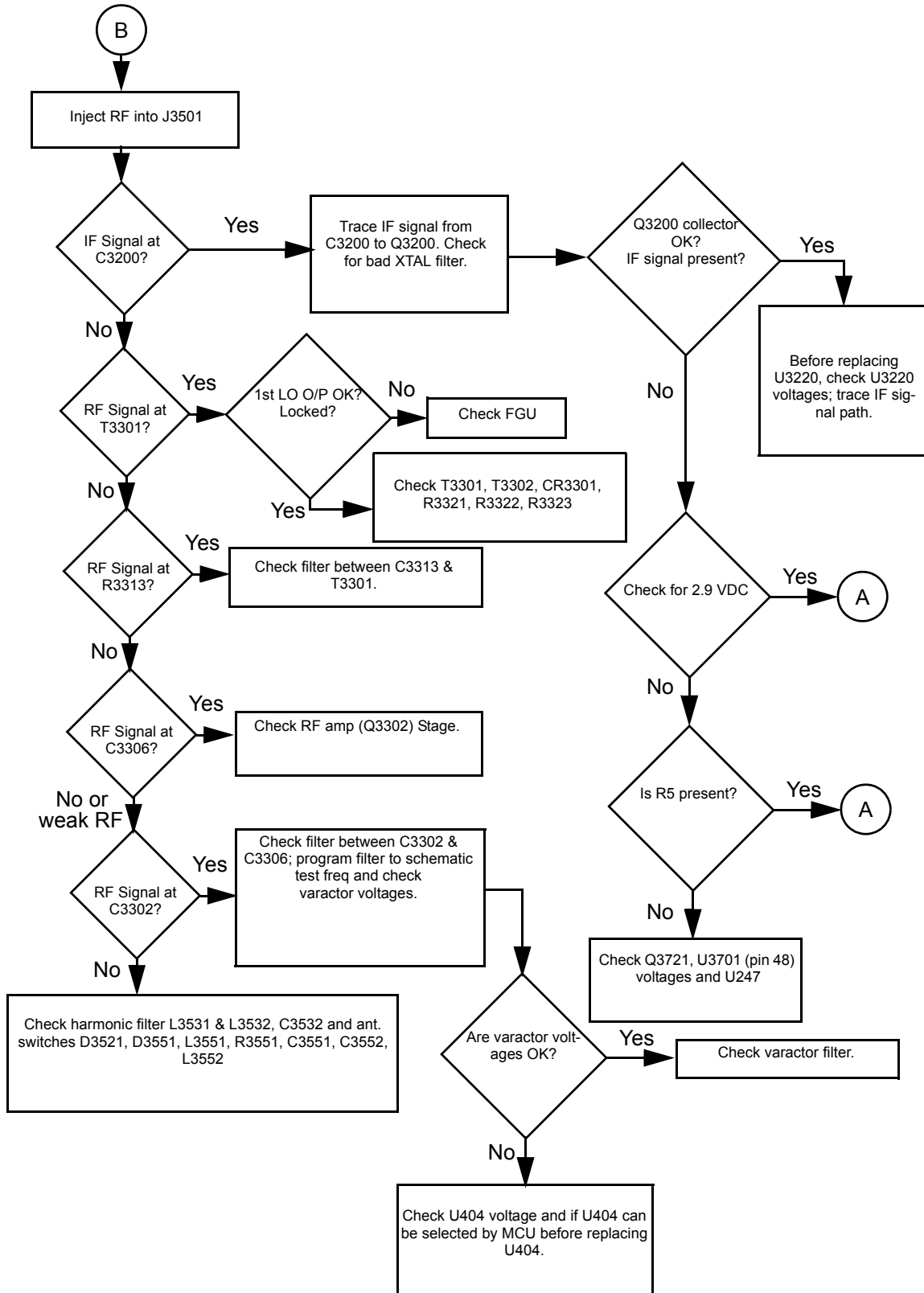
3.10 VHF Troubleshooting Charts



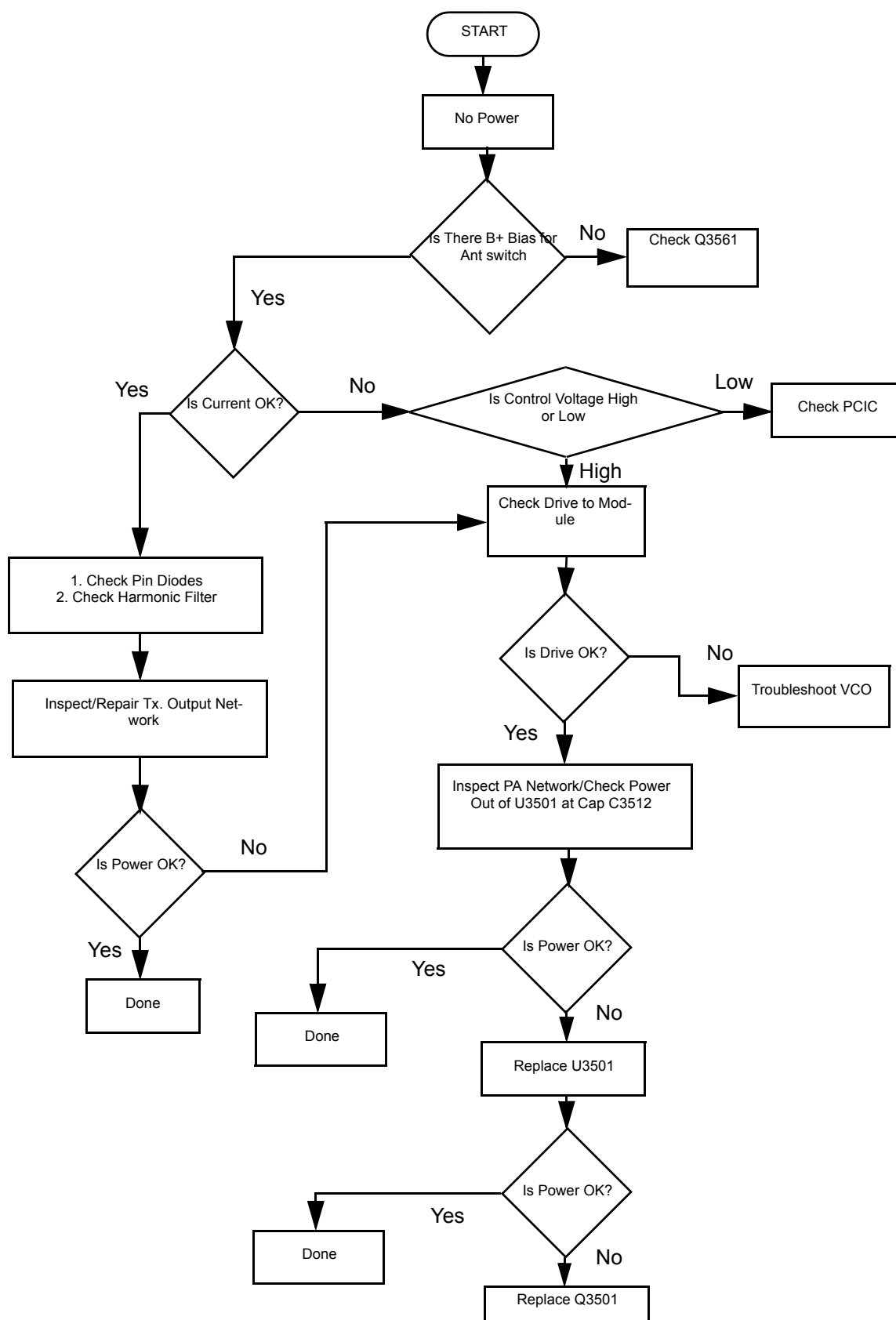
Troubleshooting Flow Chart for Controller



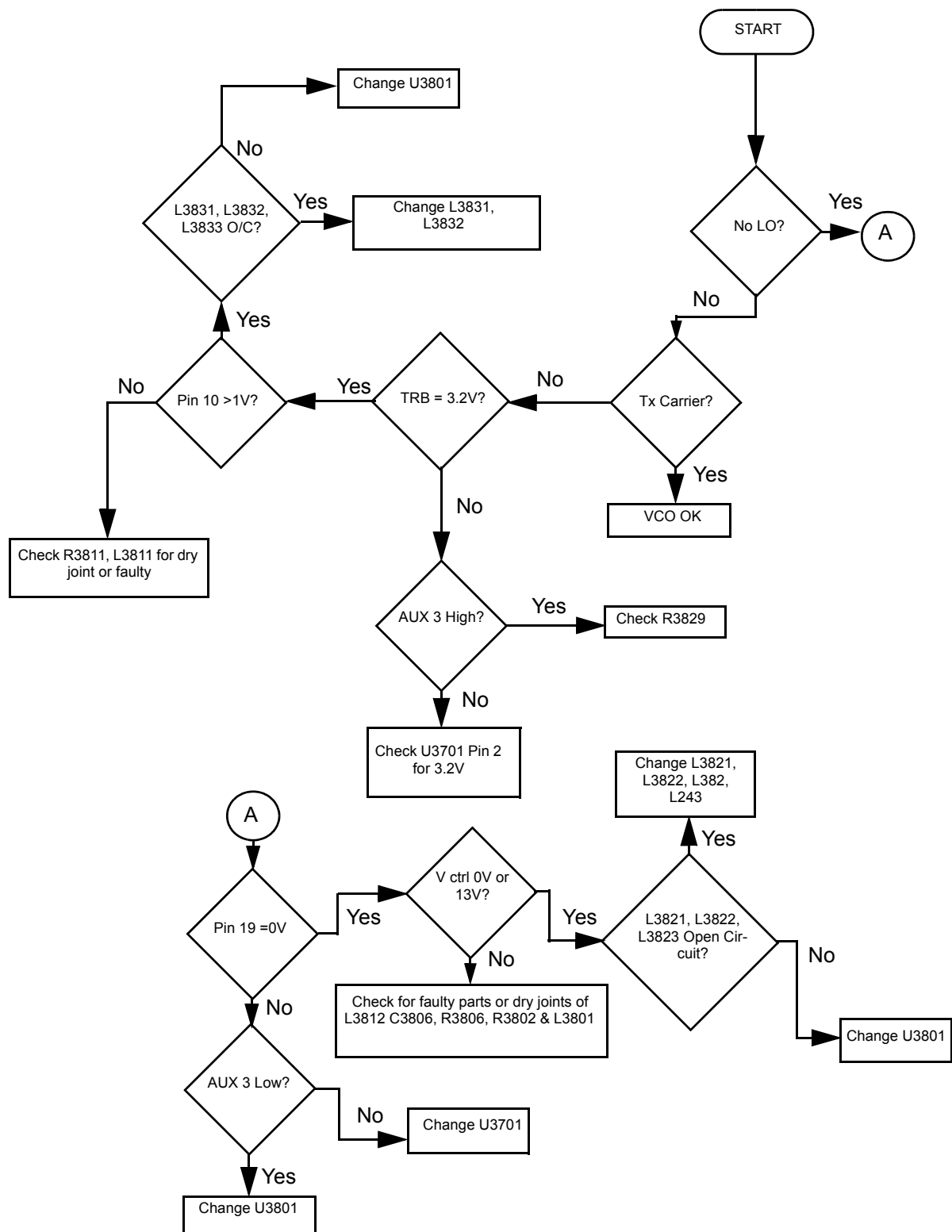
Troubleshooting Flow Chart for Receiver (Sheet 1 of 2)



Troubleshooting Flow Chart for Receiver (Sheet 2 of 2)

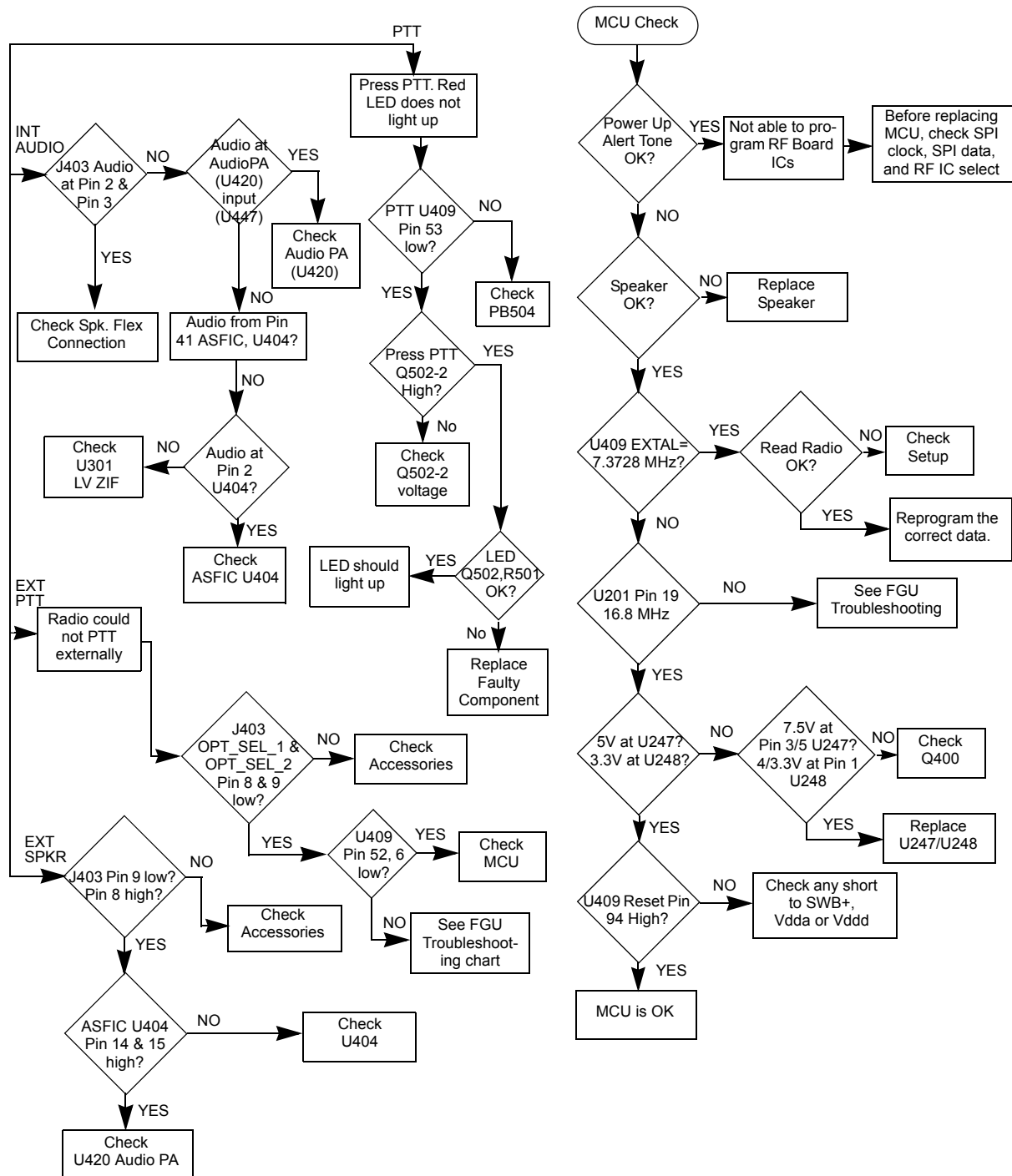


Troubleshooting Flow Chart for Transmitter

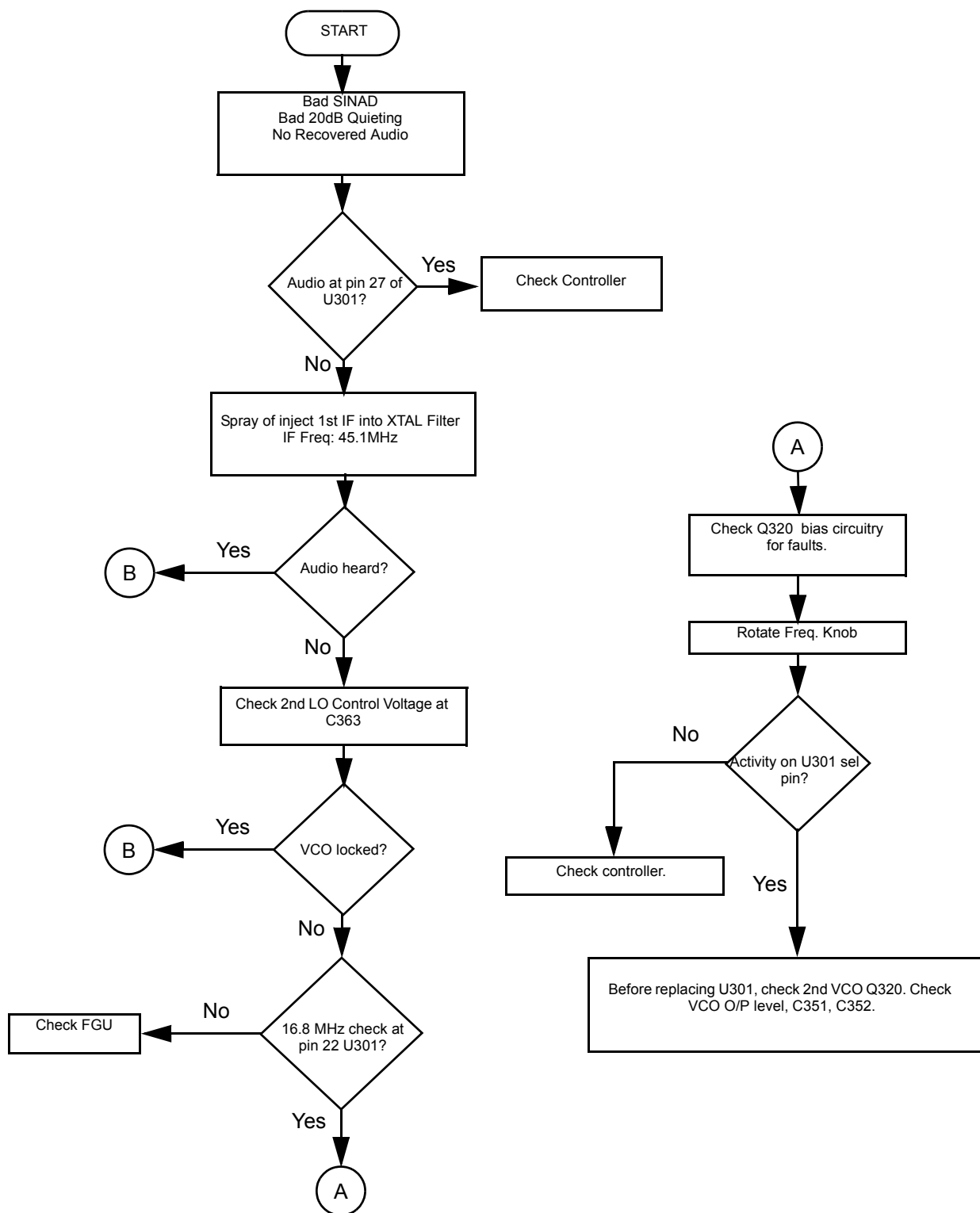


Troubleshooting Flow Chart for VCO

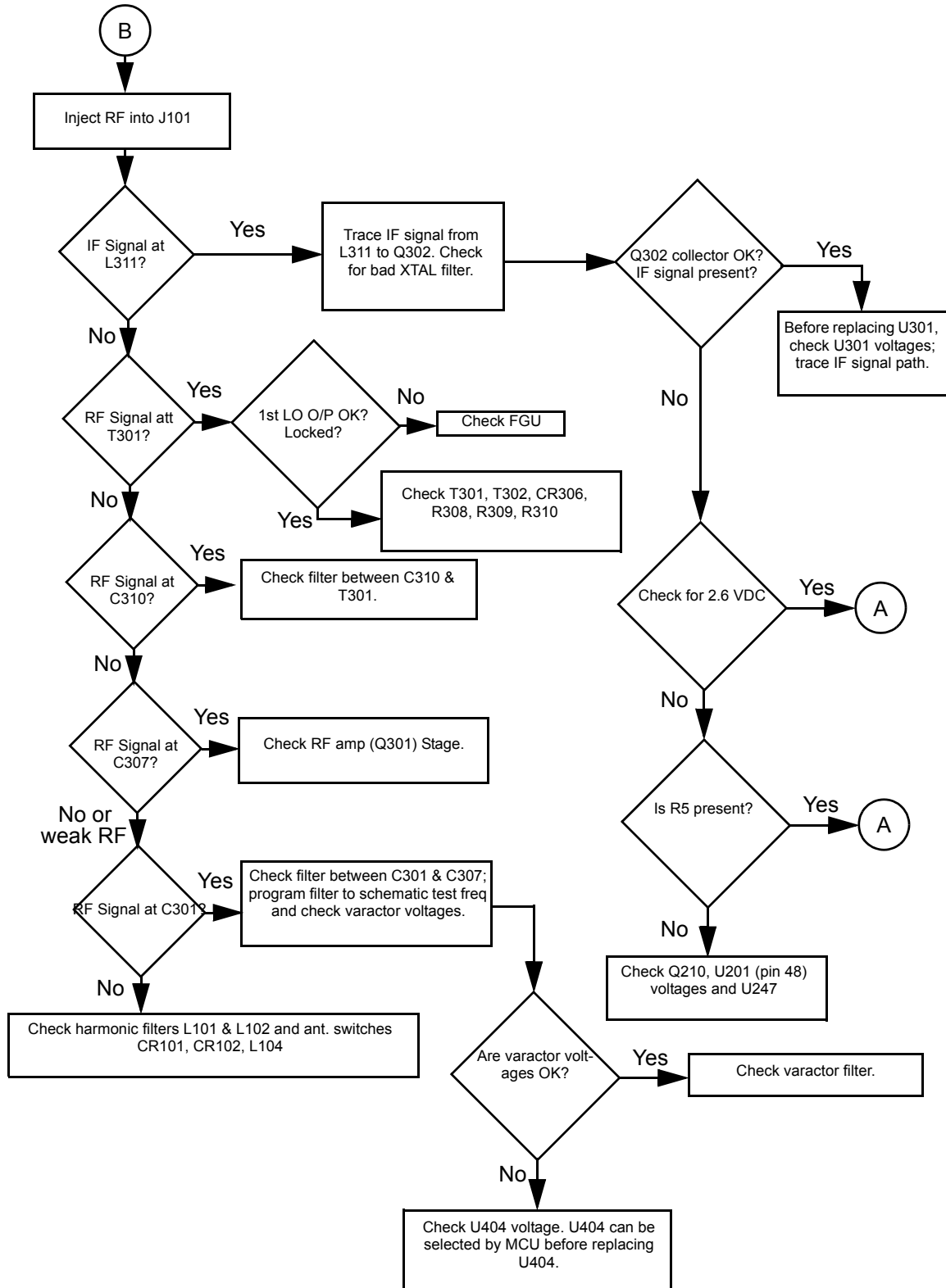
3.11 UHF (Band 1 and Band 2) Troubleshooting Charts



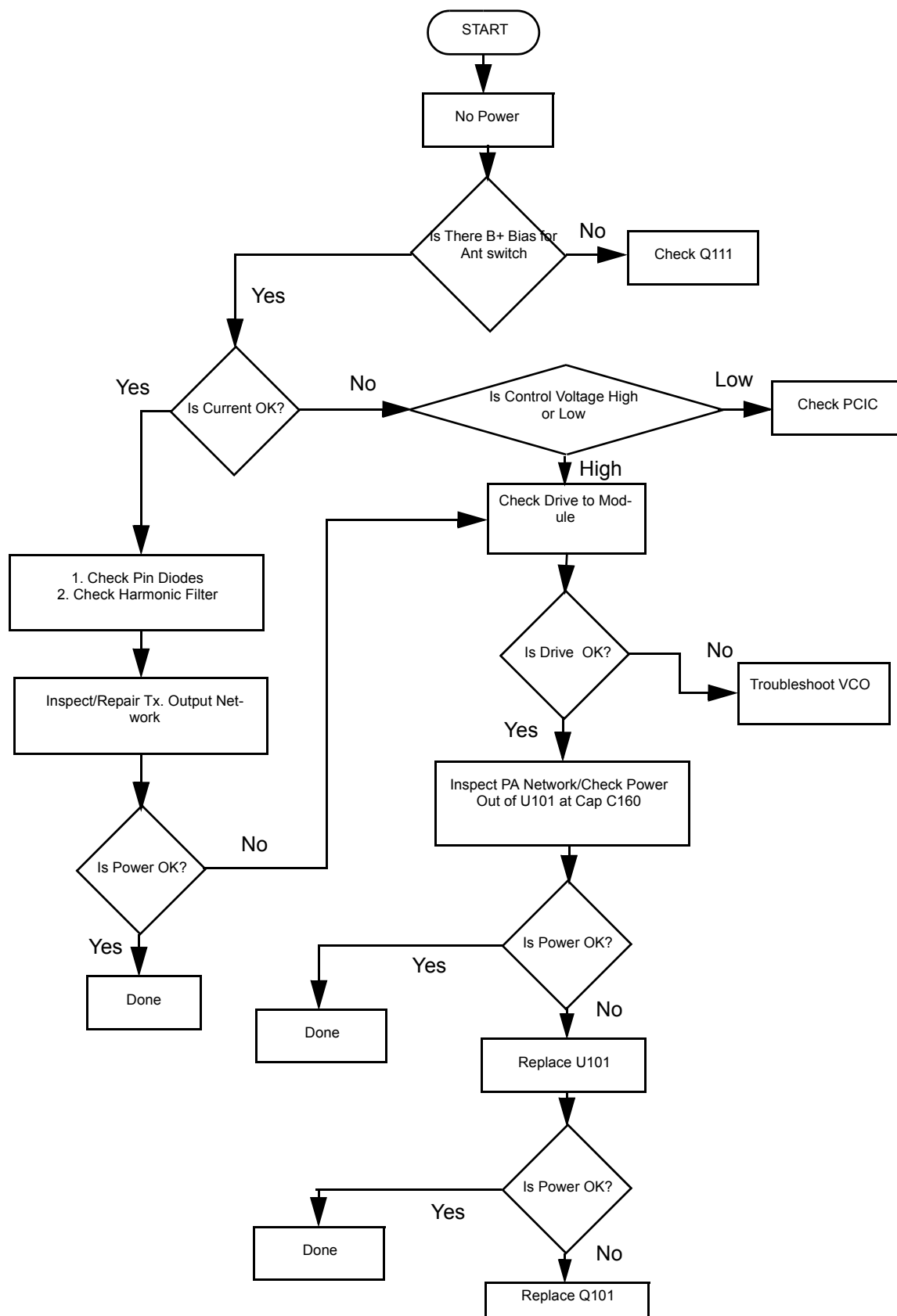
Troubleshooting Flow Chart for Controller



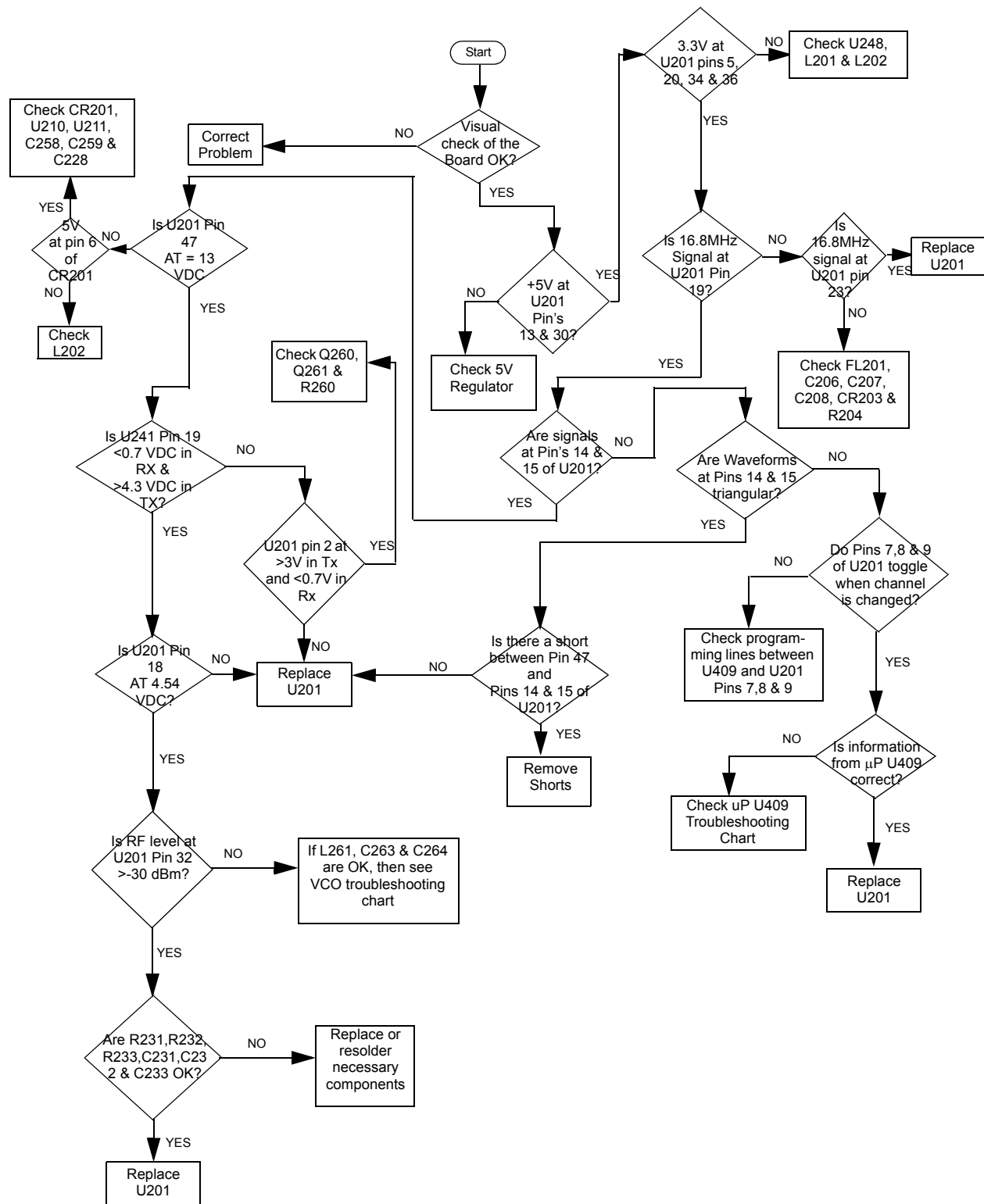
Troubleshooting Flow Chart for Receiver (Sheet 1 of 2)



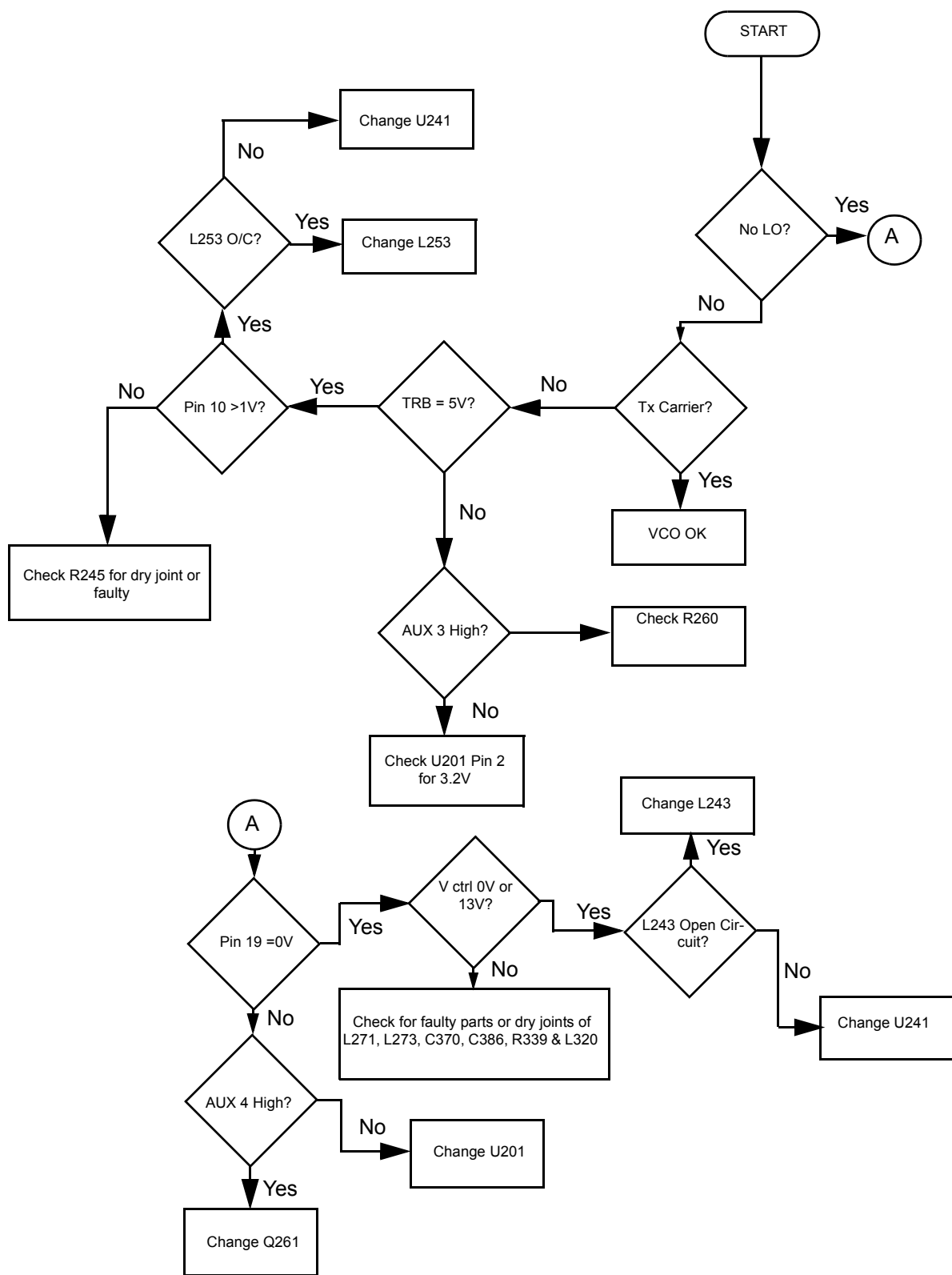
Troubleshooting Flow Chart for Receiver (Sheet 2 of 2)



Troubleshooting Flow Chart for Transmitter

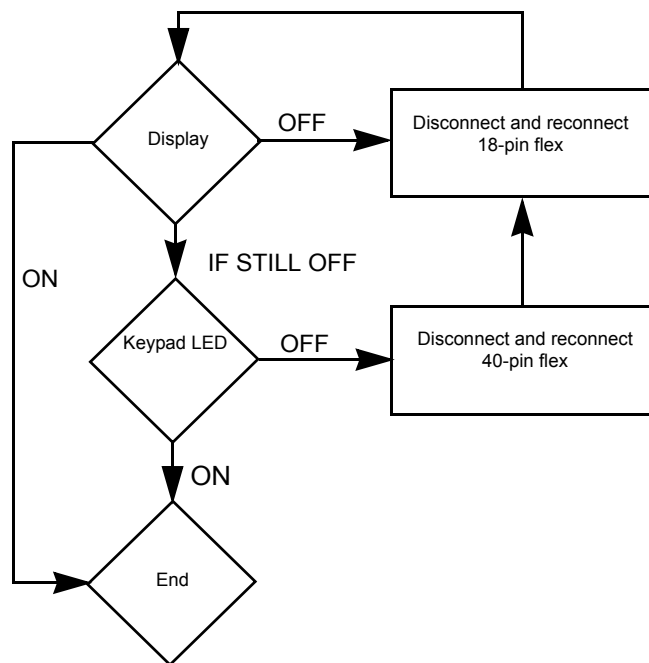


Troubleshooting Flow Chart for Synthesizer



Troubleshooting Flow Chart for VCO

3.12 Keypad Troubleshooting Chart



Chapter 4 Schematic Diagrams, Overlays, and Part Lists

4.1 Introduction

This chapter provides schematic diagrams, overlays, and parts lists for the radio circuit board and interface connections.

4.1.1 Notes For All Schematics and Circuit Boards

* Component is frequency sensitive. Refer to the Electrical Parts List for value and usage.

1. Unless otherwise stated, resistances are in Ohms ($k = 1000$), and capacitances are in picofarads (pF) or microfarads (μF).
2. DC voltages are measured from point indicated to chassis ground using a Motorola DC multimeter or equivalent. Transmitter measurements should be made with a $1.2 \mu H$ choke in series with the voltage probe to prevent circuit loading.
3. Reference Designators are assigned in the following manner:

100 Series	=	Transmitter UHF
200 Series	=	Frequency Generation UHF
300 Series	=	Receiver UHF
400/500 Series	=	Controller
600 Series	=	Keypad Board
3200 Series	=	IF Circuitry
3300 Series	=	Receiver VHF
3500 Series	=	Transmitter VHF
3700/3800 Series	=	Frequency Generation VHF

4. Interconnect Tie Point Legend:

UNSWB+	=	Unswitch Battery Voltage (7.5V)
SWB+	=	Switch Battery Voltage (7.5V)
R5	=	Receiver Five Volts
CLK	=	Clock
Vdda	=	Regulated 3.3 Volts (for analog)
Vddd	=	Regulated 3.3 Volts (for digital)
CSX	=	Chip Select Line (not for LVZIF)
SYN	=	Synthesizer
DACRX	=	Digital to Analog Voltage (For Receiver Front End Filter)
VSF	=	Voltage Super Filtered (5 volts)
VR	=	Voltage Regulator

6-LAYER CIRCUIT BOARD DETAIL VIEWING COPPER STEPS IN PROPER LAYER SEQUENCE

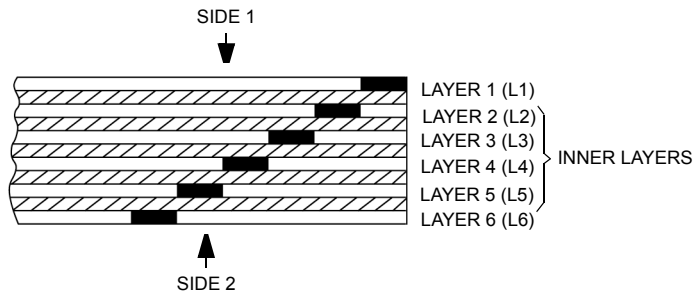


Figure 4-1. Circuit Board Layering Sequence

4.2 RF - Controller Interconnect Flex

4.2.1 Plain

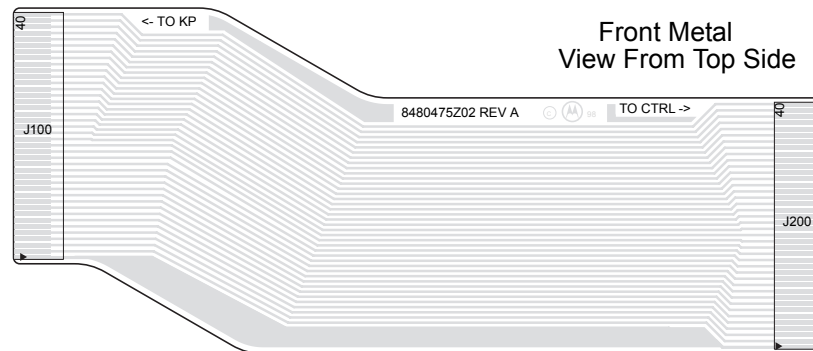


Figure 4-2. Plain Controller Interconnect Flex

4.2.2 Keypad

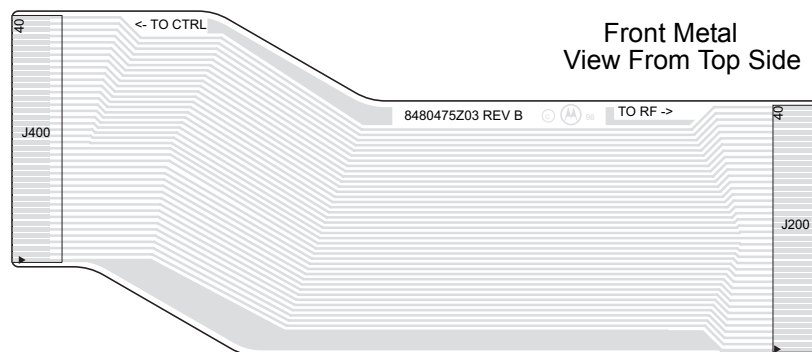


Figure 4-3. Keypad Controller Interconnect Flex

4.2.3 Schematic for RF - Controller Interconnect Flex

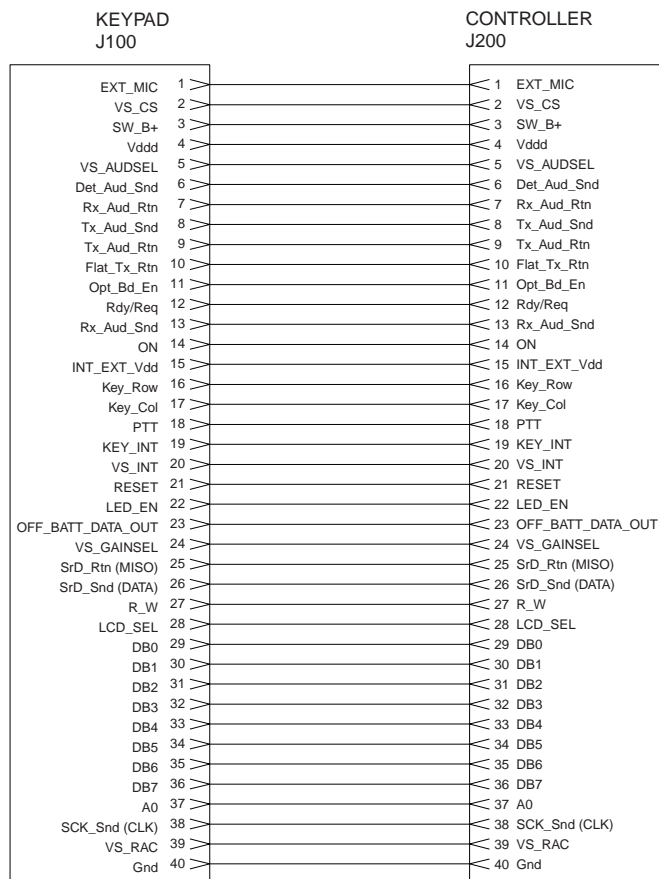
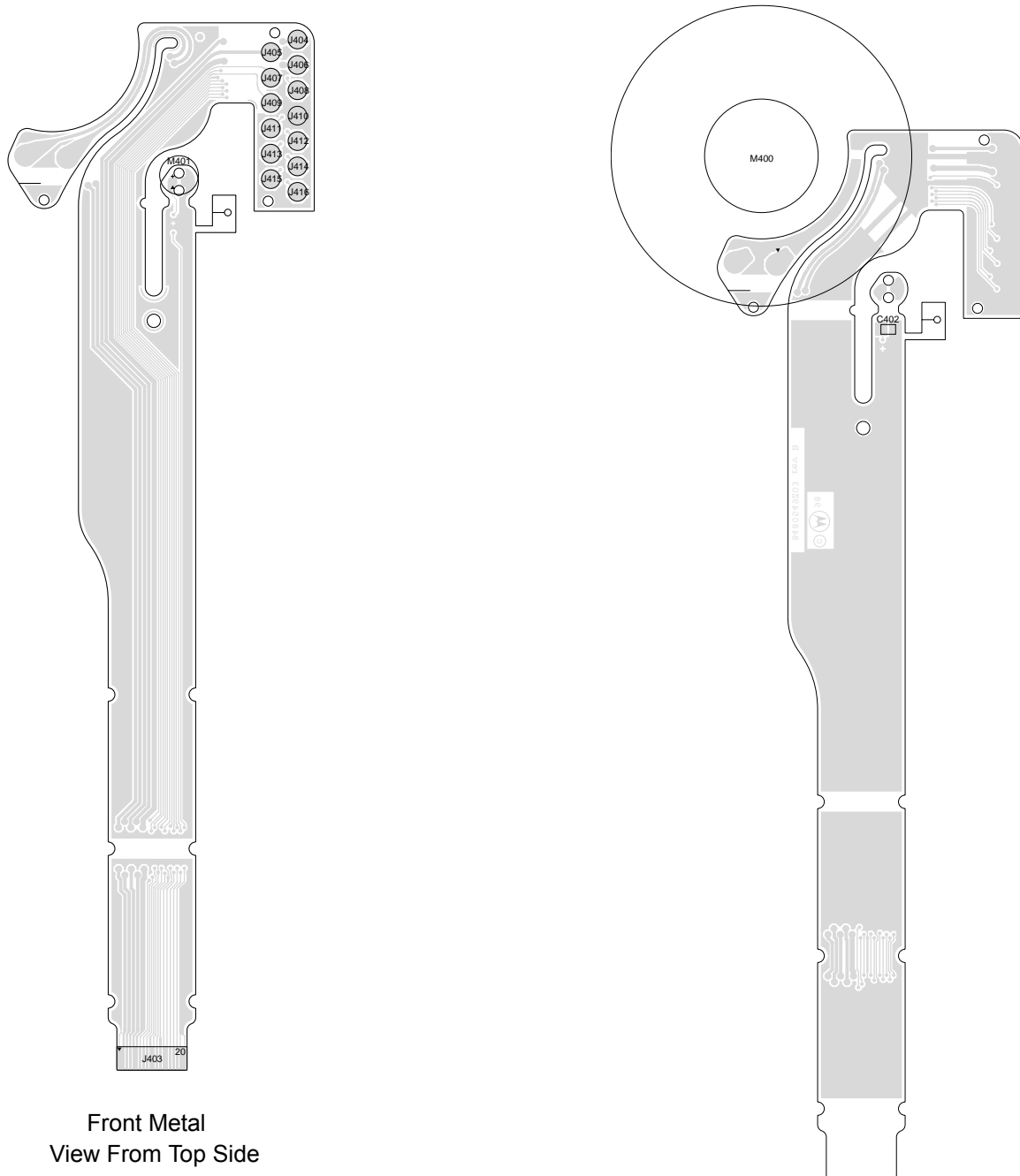


Figure 4-4. Keypad-Controller Interconnect Schematic Diagram

4.2.4 Parts List for Keypad-Controller Interconnect Flex

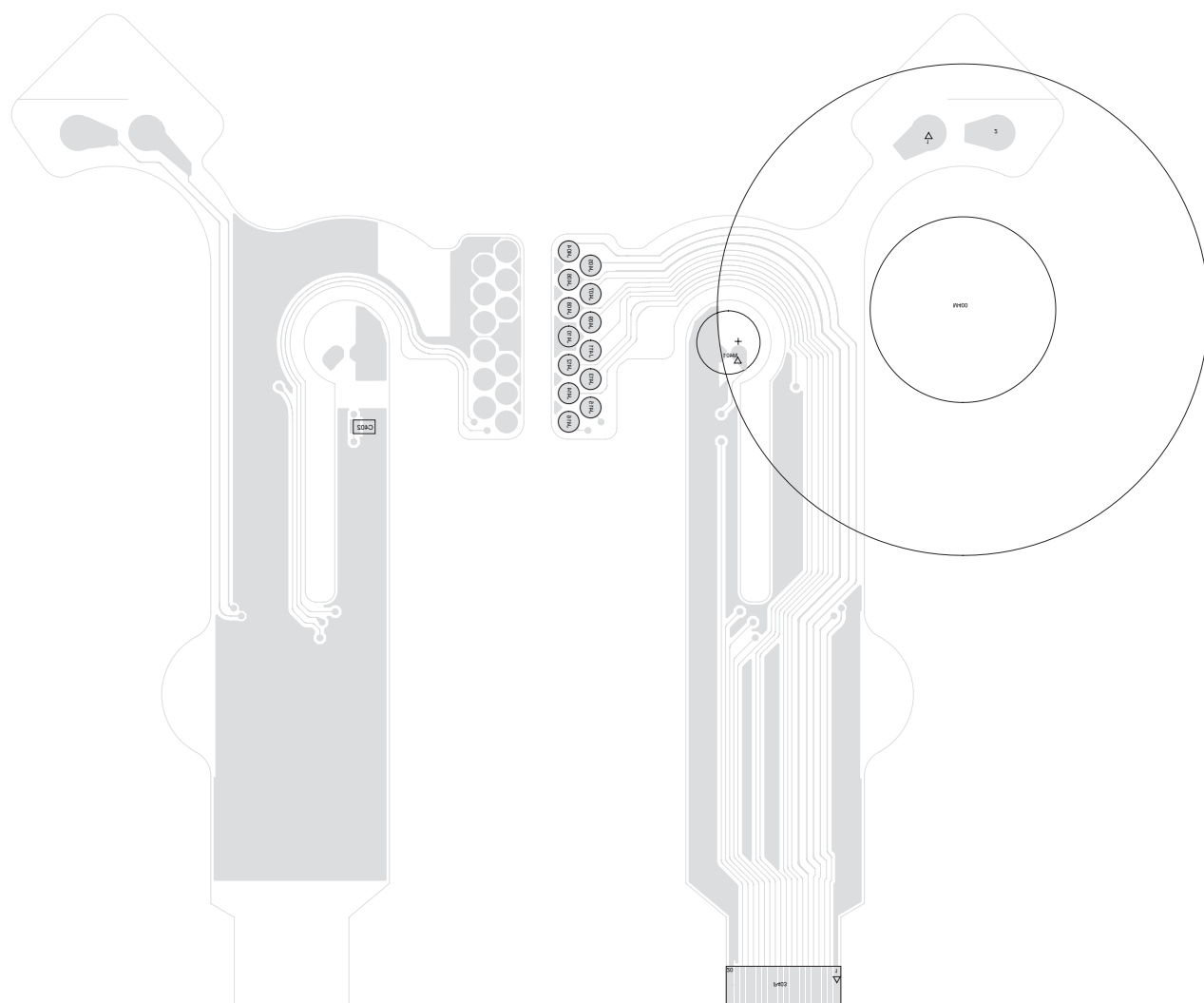
Reference Symbol	Motorola Part No.	Description
J100	0980521Z01	Connector, 40 pin
J200	0905505Y04	Speaker, 20 ohm

4.2.5 Universal Connector Flex Plain



Front Metal
View From Top Side

Figure 4-5. Universal Flex Connector Plain



Front Metal
View From Top Side
(for 8471612L01)

Back Metal
View From Back Side
(for 8471612L01)

Figure 4-6. Universal Flex Connector Plain (for 8471612L01)

4.2.6 Universal Connector Flex Keypad

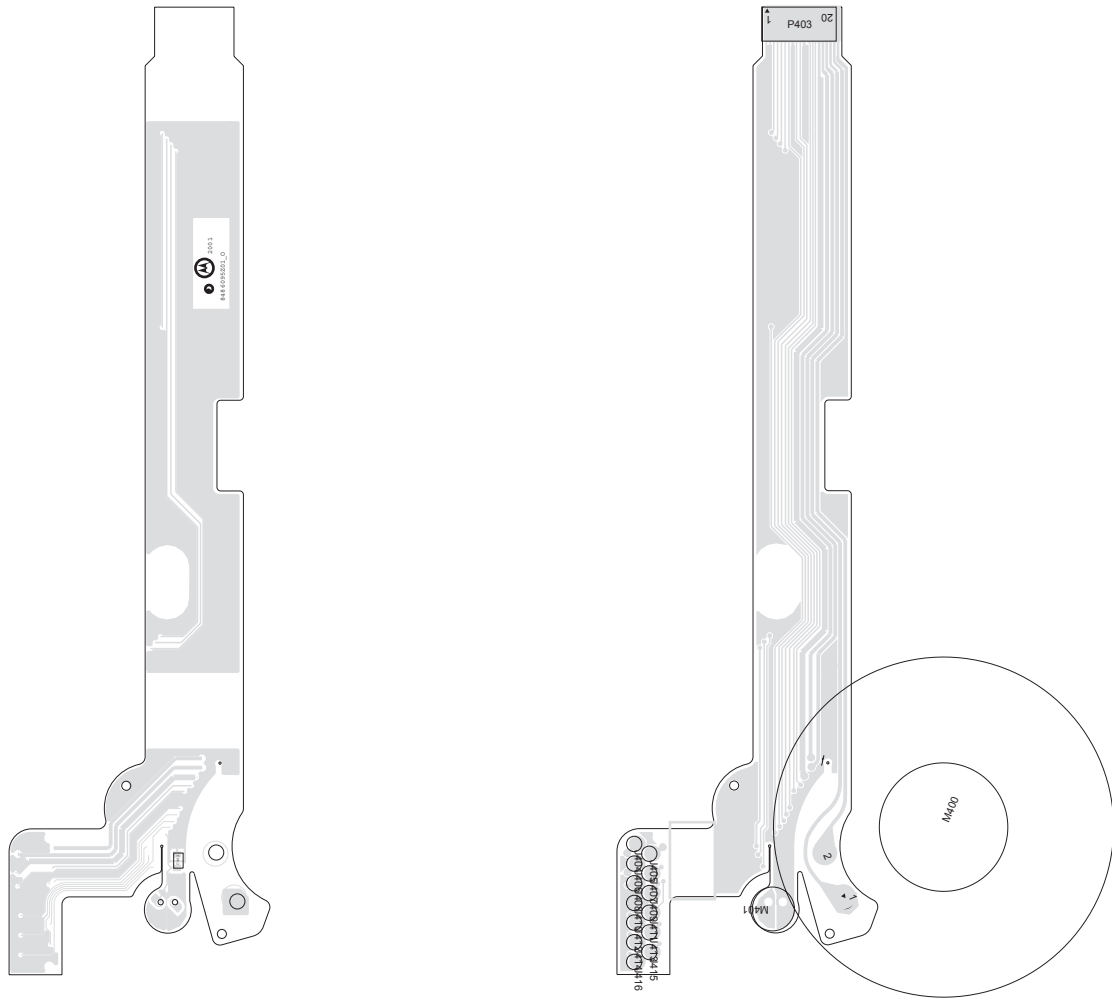


Figure 4-7. Universal Flex Connector Keypad

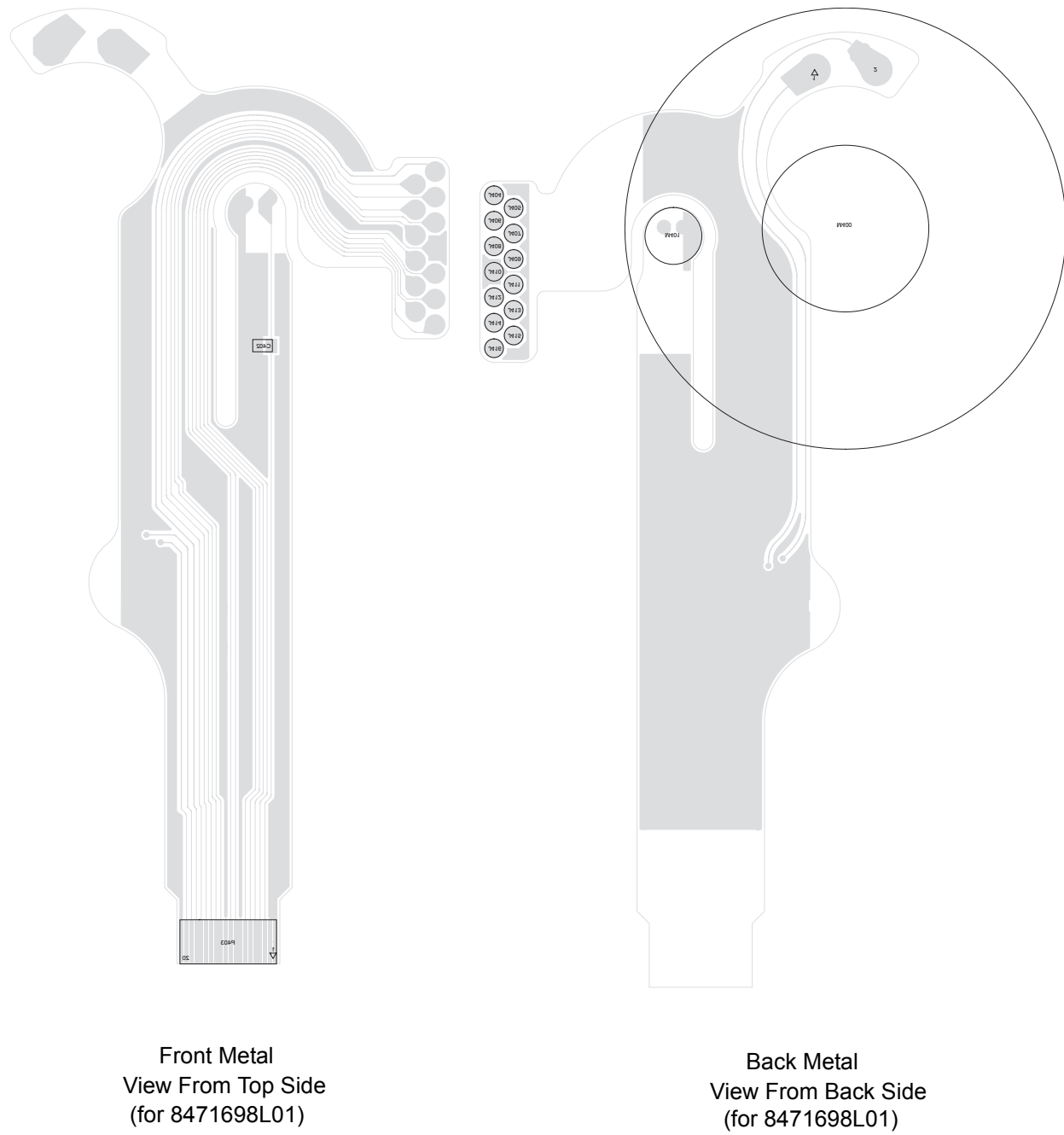


Figure 4-8. Universal Flex Connector Keypad (for 8471698L01)

4.2.7 Schematic for Universal Connector Flex Plain

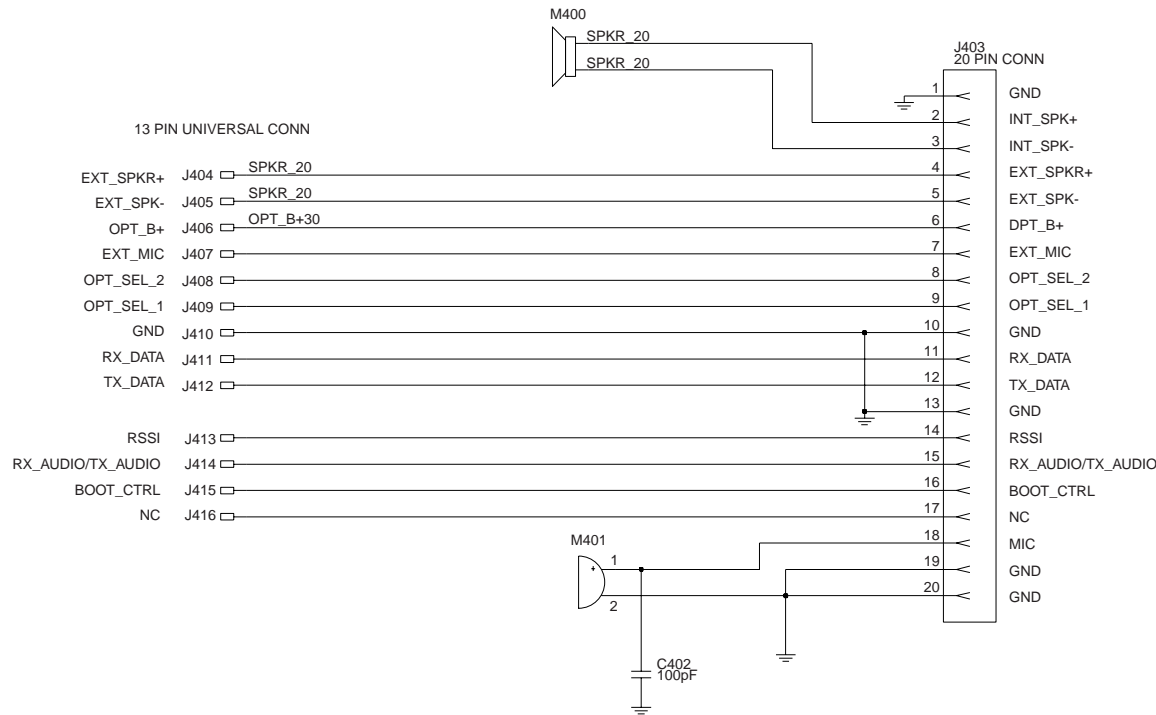


Figure 4-9. Universal Connector Schematic Diagram

4.2.8 Parts List for Universal Connector Flex Plain

Reference Symbol	Motorola Part No.	Description
C402	2113740A55	Cap, 100pF
M400	5005679X01	Speaker, 24 ohm
M401	5013920A04	Mic, Mini electrec

4.2.9 Parts List for Universal Connector Flex Plain (For Flex No. 8471612L01)

Reference Symbol	Motorola Part No.	Description
C402	2113944F01	Cap, 100pF
M400	5005679X07	Speaker, 24 ohm
M401	5015027H01	Mic, Mini electrec

4.2.10 Schematic for Universal Connector Flex Keypad

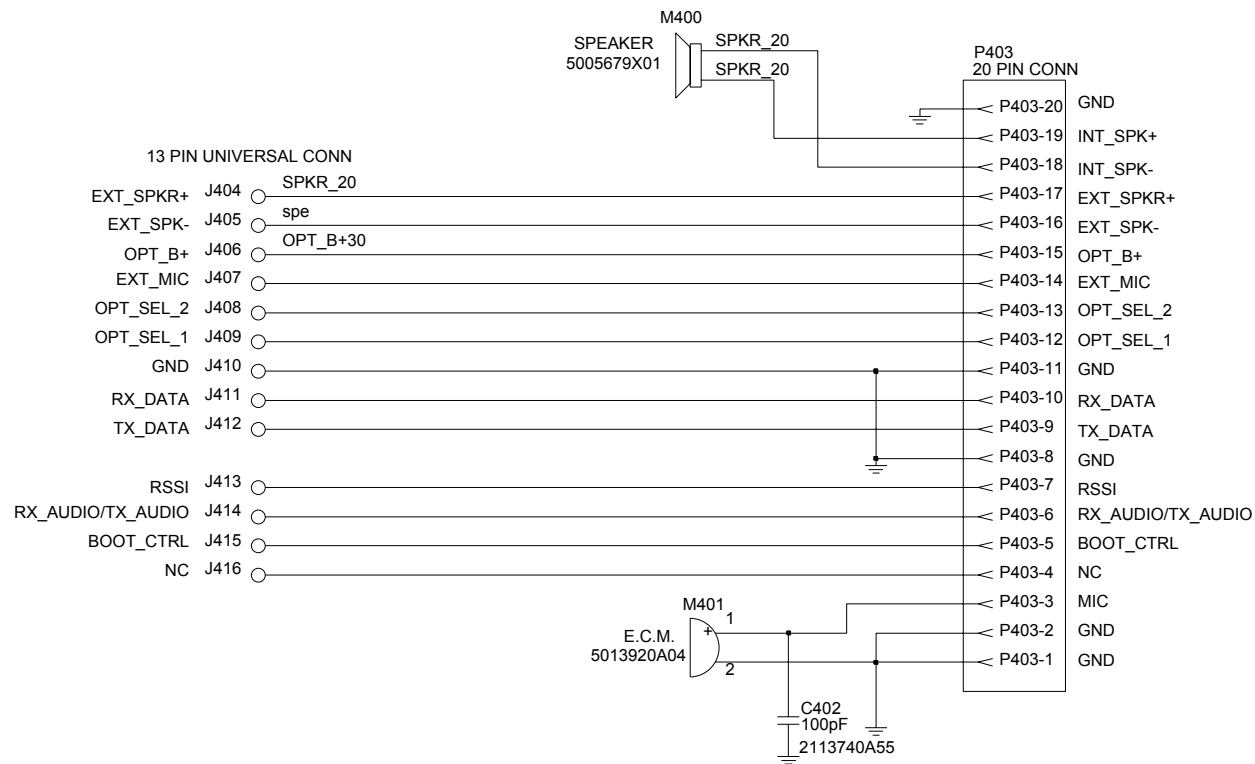


Figure 4-10. Universal Connector Schematic Diagram Keypad

4.2.11 Parts List for Universal Connector Flex Keypad

Reference Symbol	Motorola Part No.	Description
C402	2113740A55	Cap, 100pF
M400	5086094Z01	Speaker, 20 ohm
M401	5013920A04	Mic, Mini electrec

4.2.12 Parts List for Universal Connector Flex Keypad (For Flex 8471698L01)

Reference Symbol	Motorola Part No.	Description
C402	2113944F01	Cap, 100pF
M400	5086094Z02	Speaker, 20 ohm
M401	5015027H01	Mic, Mini electrec

Notes

5.1 Controller Board Diagrams

ZMY0130800-O

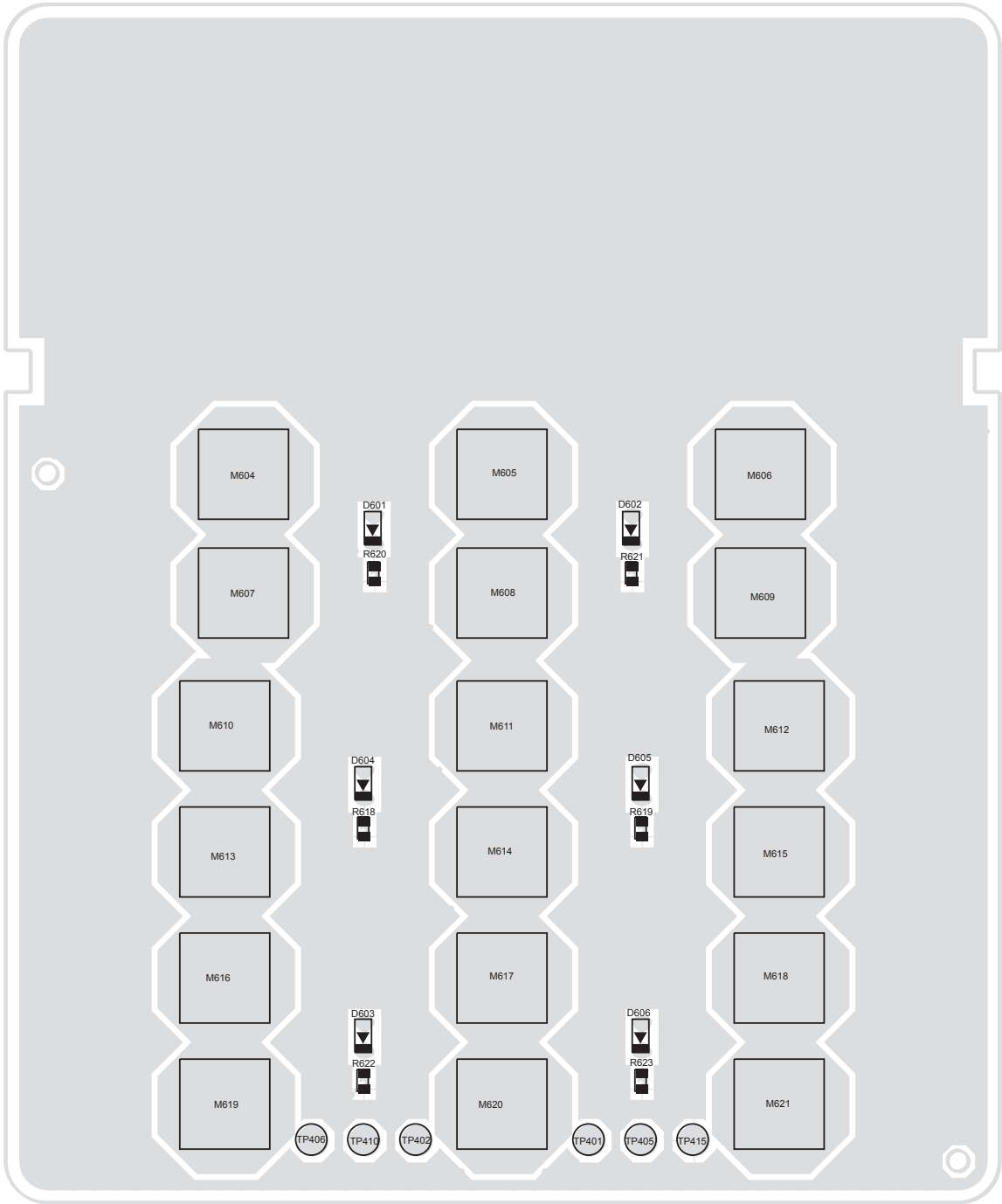


Figure 5-1: Controller Board Top View for VHF & UHF1 (PCB No. 8404051G01)

ZMY0130801-O

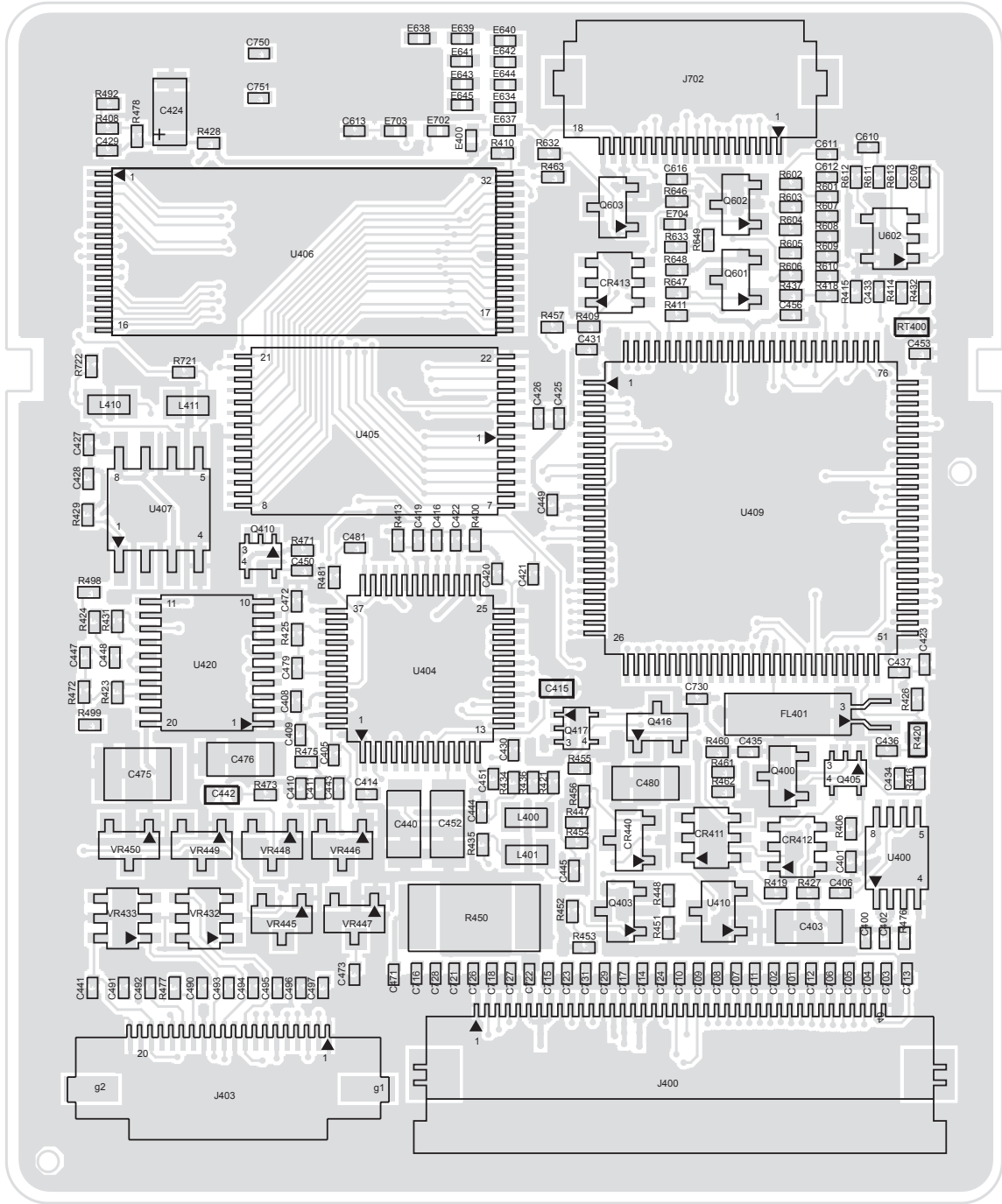
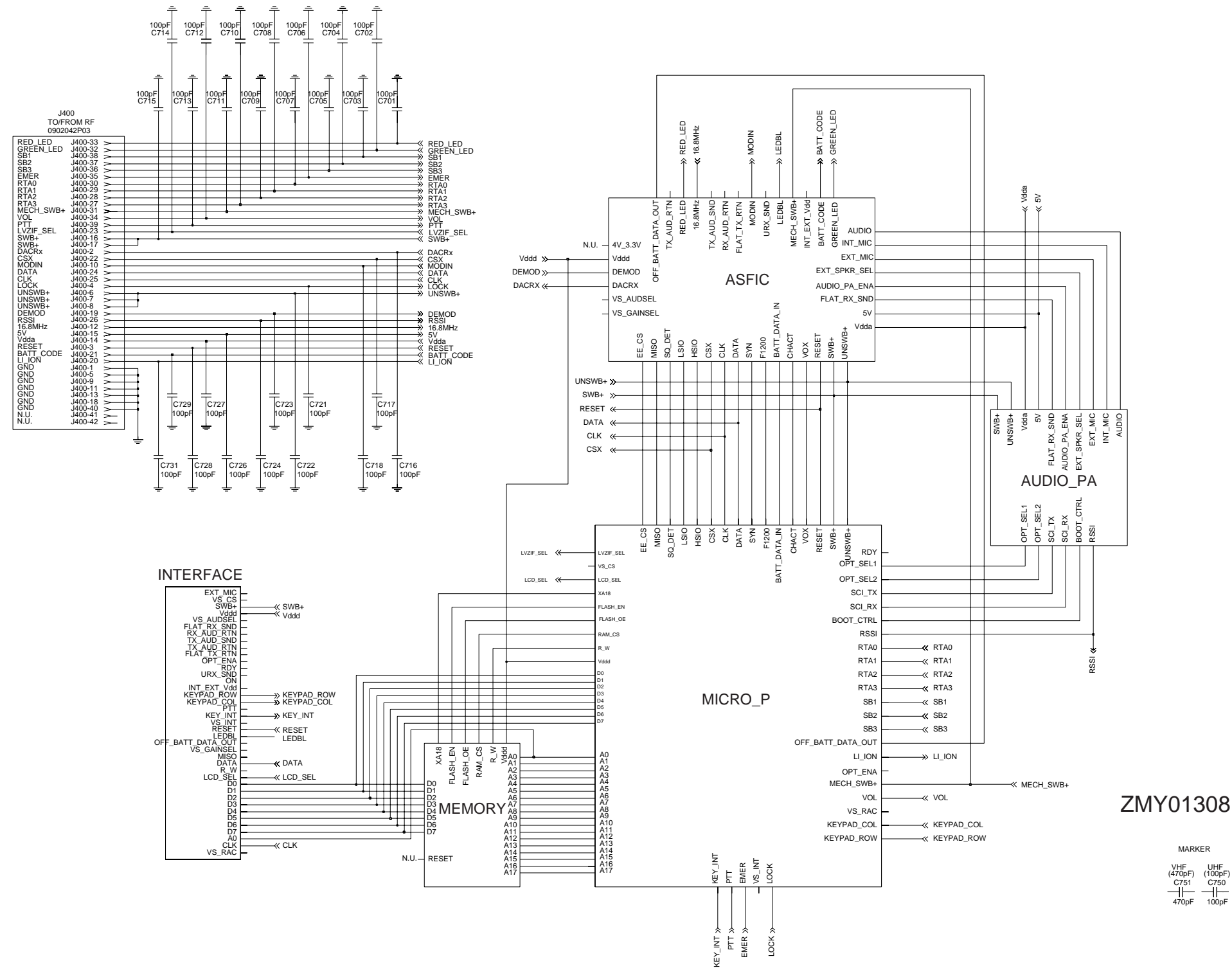


Figure 5-2: Controller Board Bottom View for VHF & UHF1 (PCB No.8404051G01)



ZMY0130816-O

Figure 5-3: Complete Controller Schematic Diagram

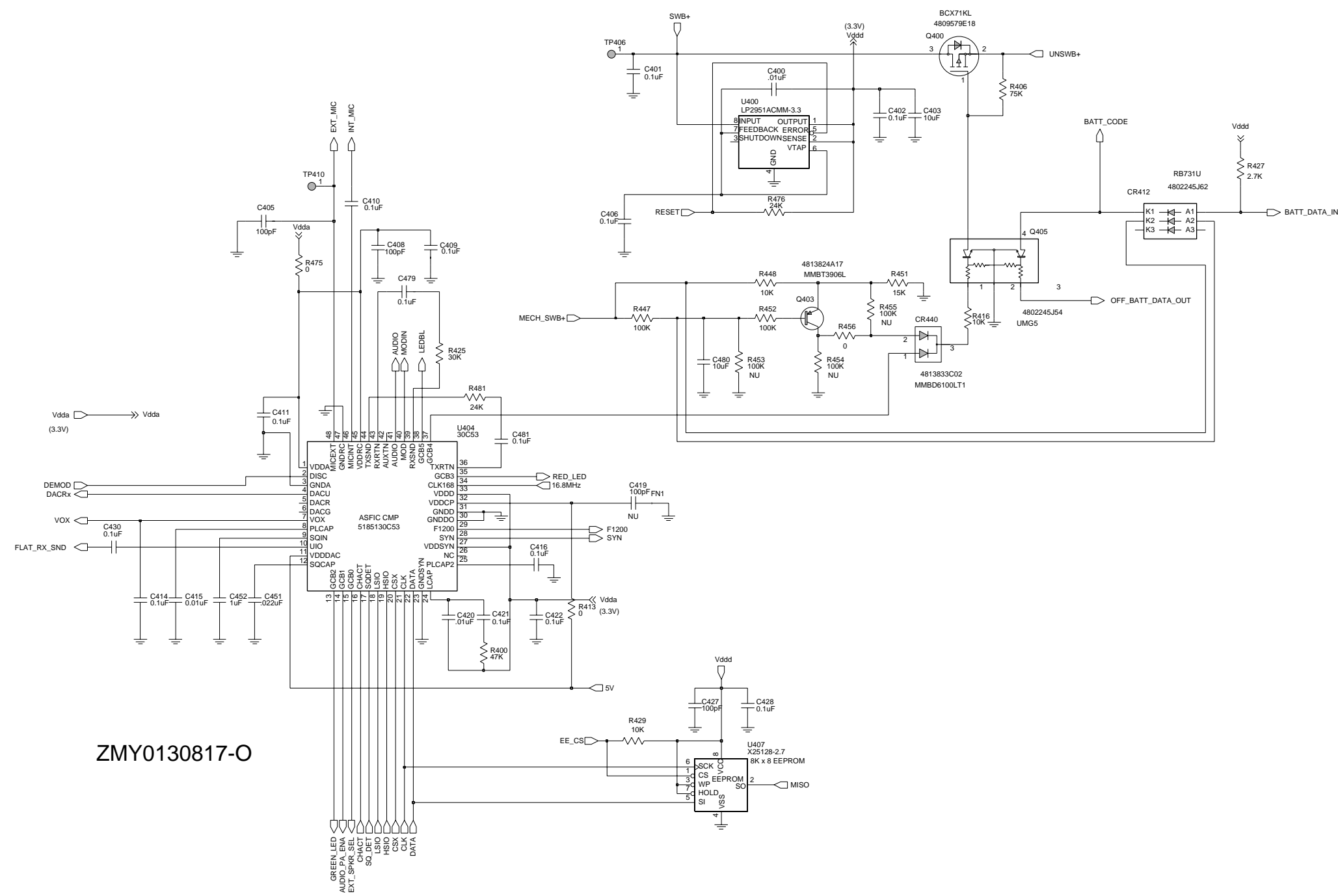


Figure 5-4: Controller ASFIC/ON_OFF Schematic Diagram

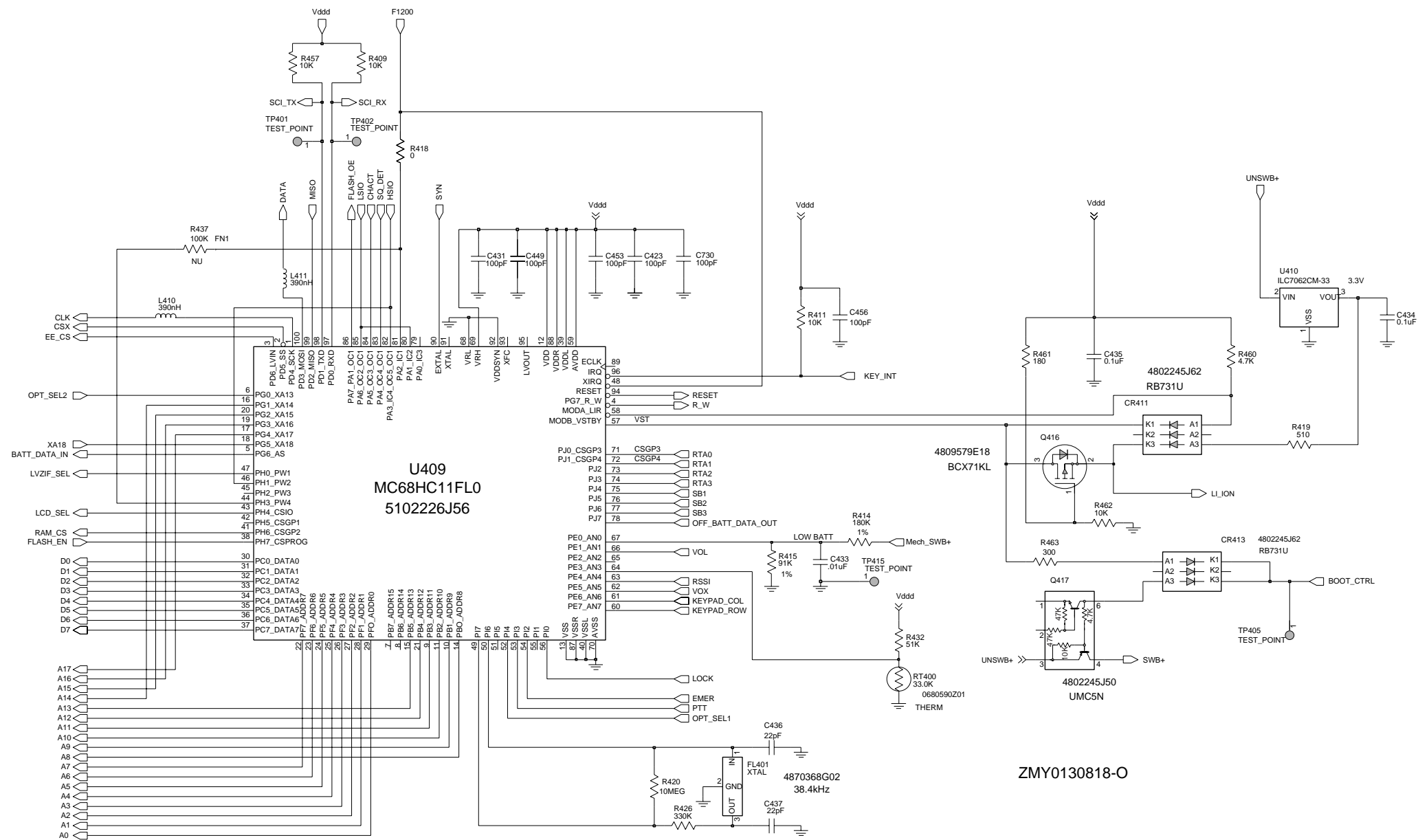


Figure 5-5: Controller Micro Processor Schematic Diagram

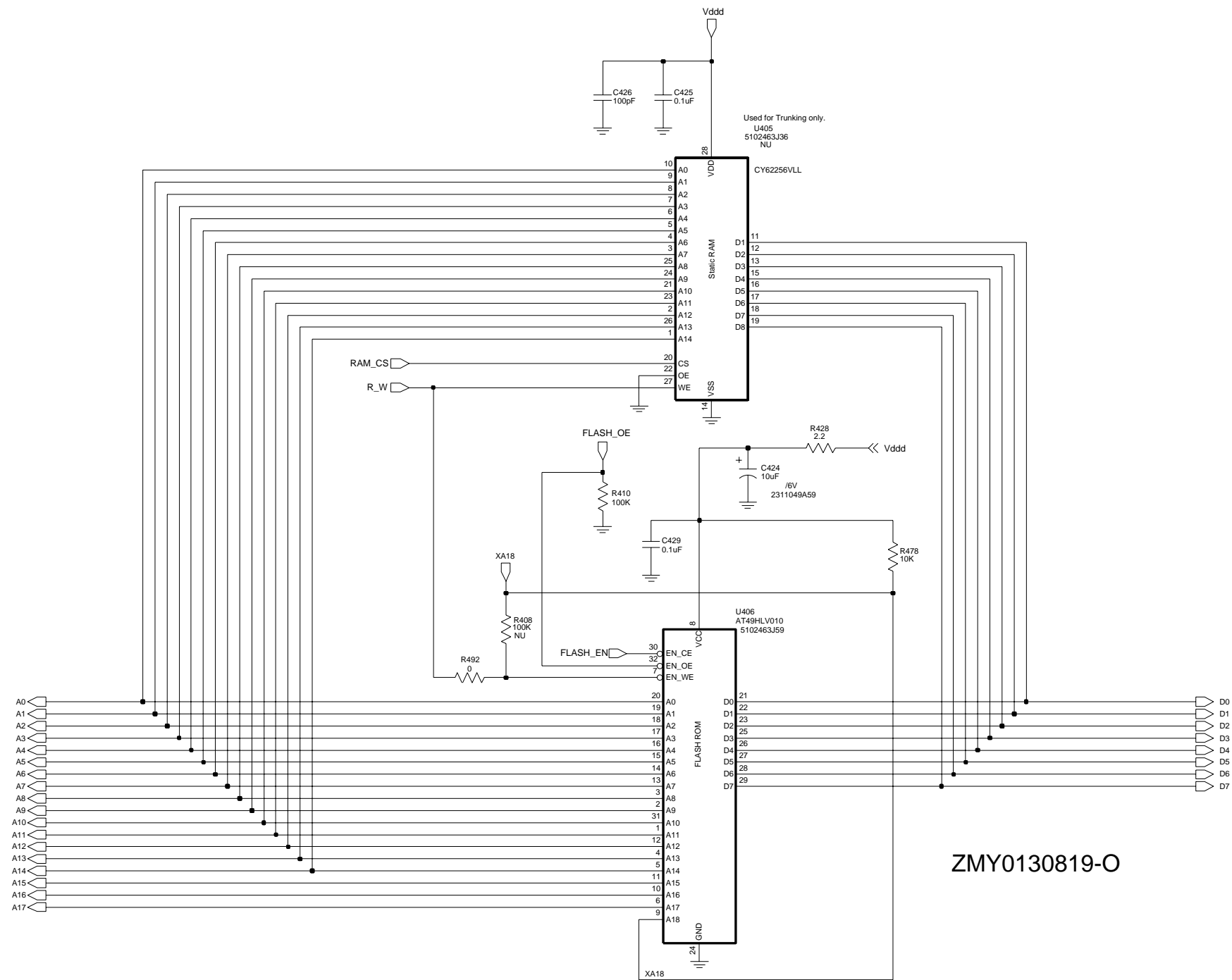


Figure 5-6: Controller Memory Schematic Diagram

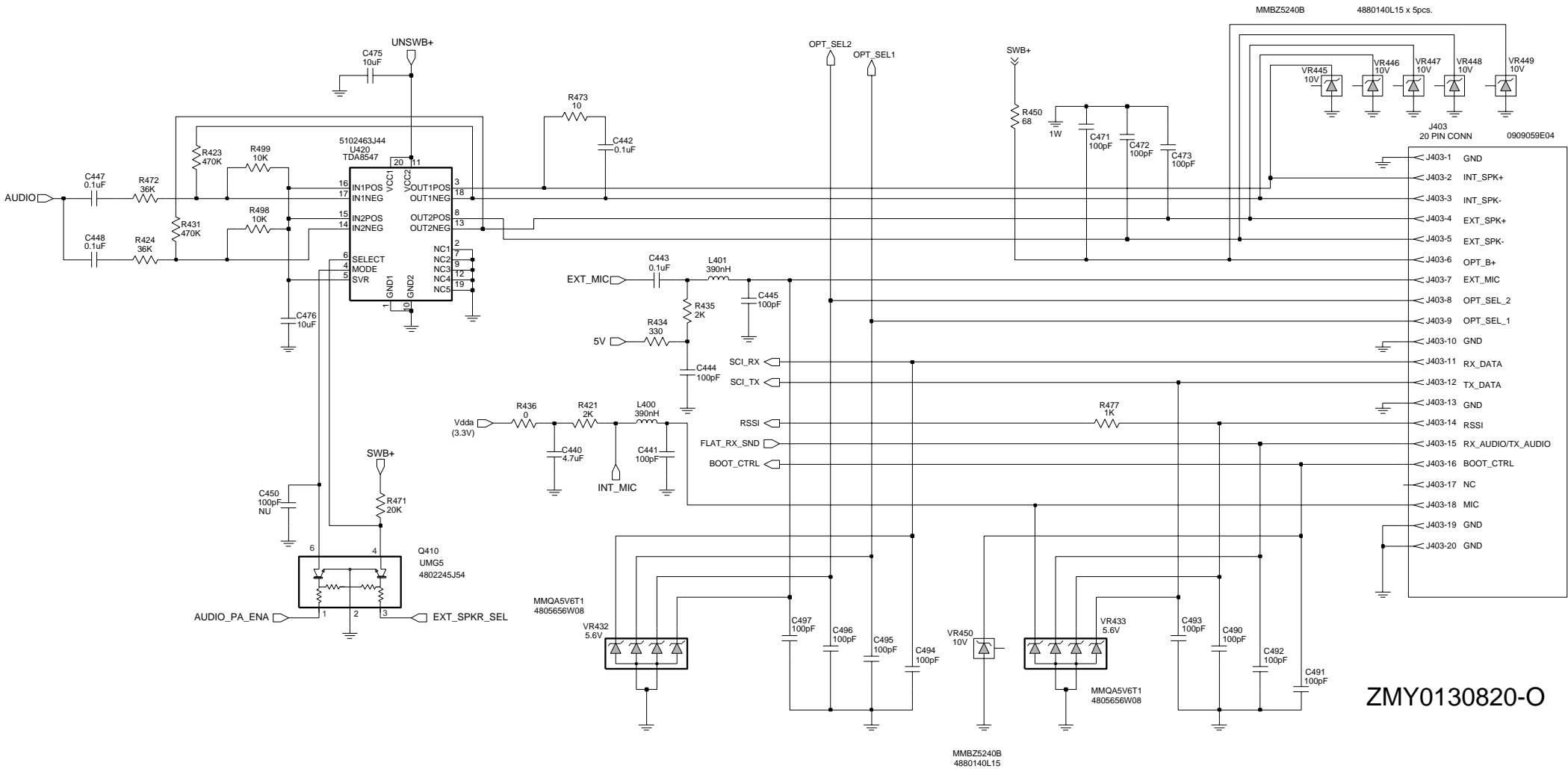


Figure 5-7: Controller Audio Power Amplifer Schematic Diagram

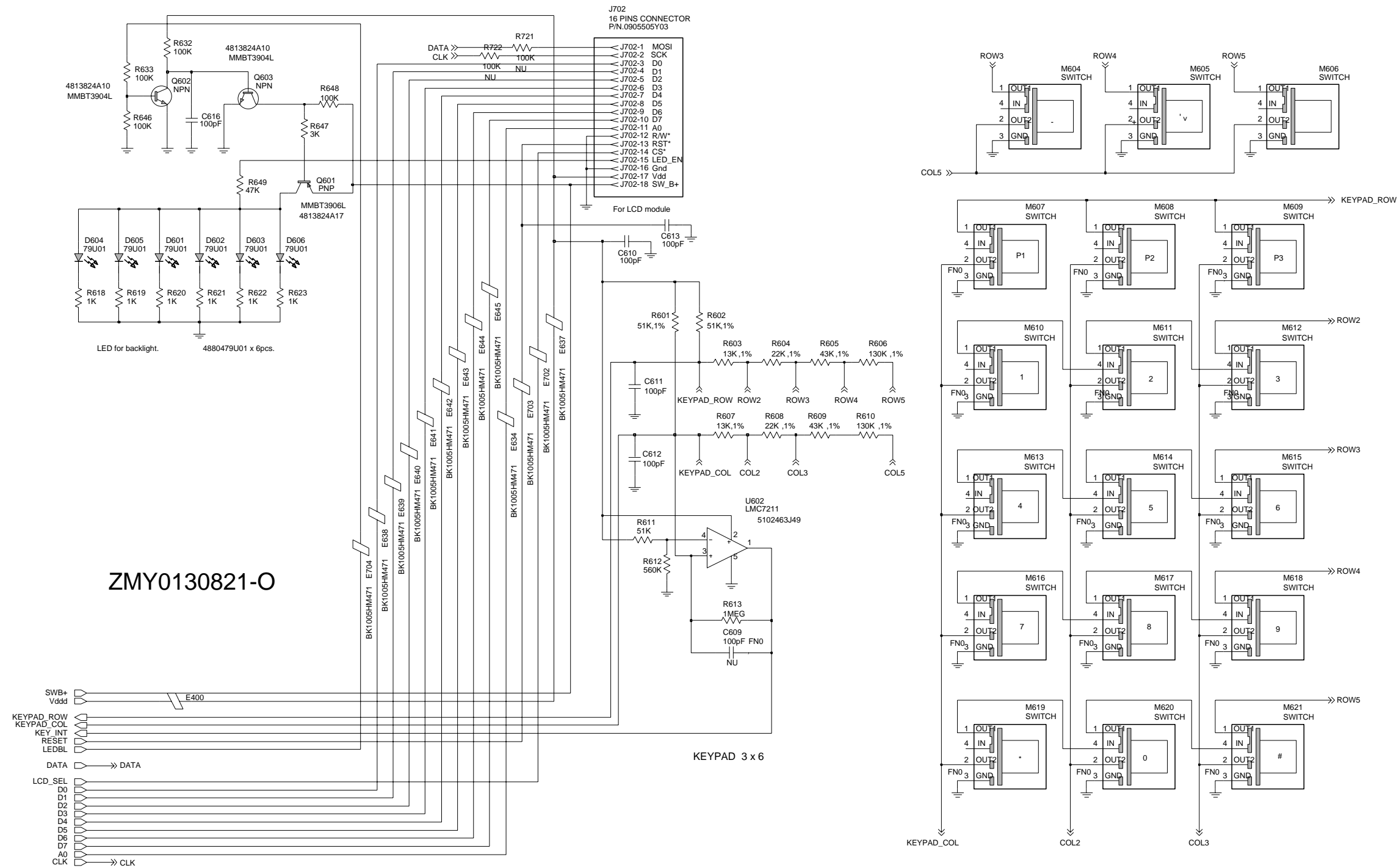


Figure 5-8: Controller Interface Schematic Diagram



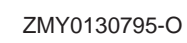


Figure 5-10: Controller Board Bottom View for (PCB No.8404056G07)

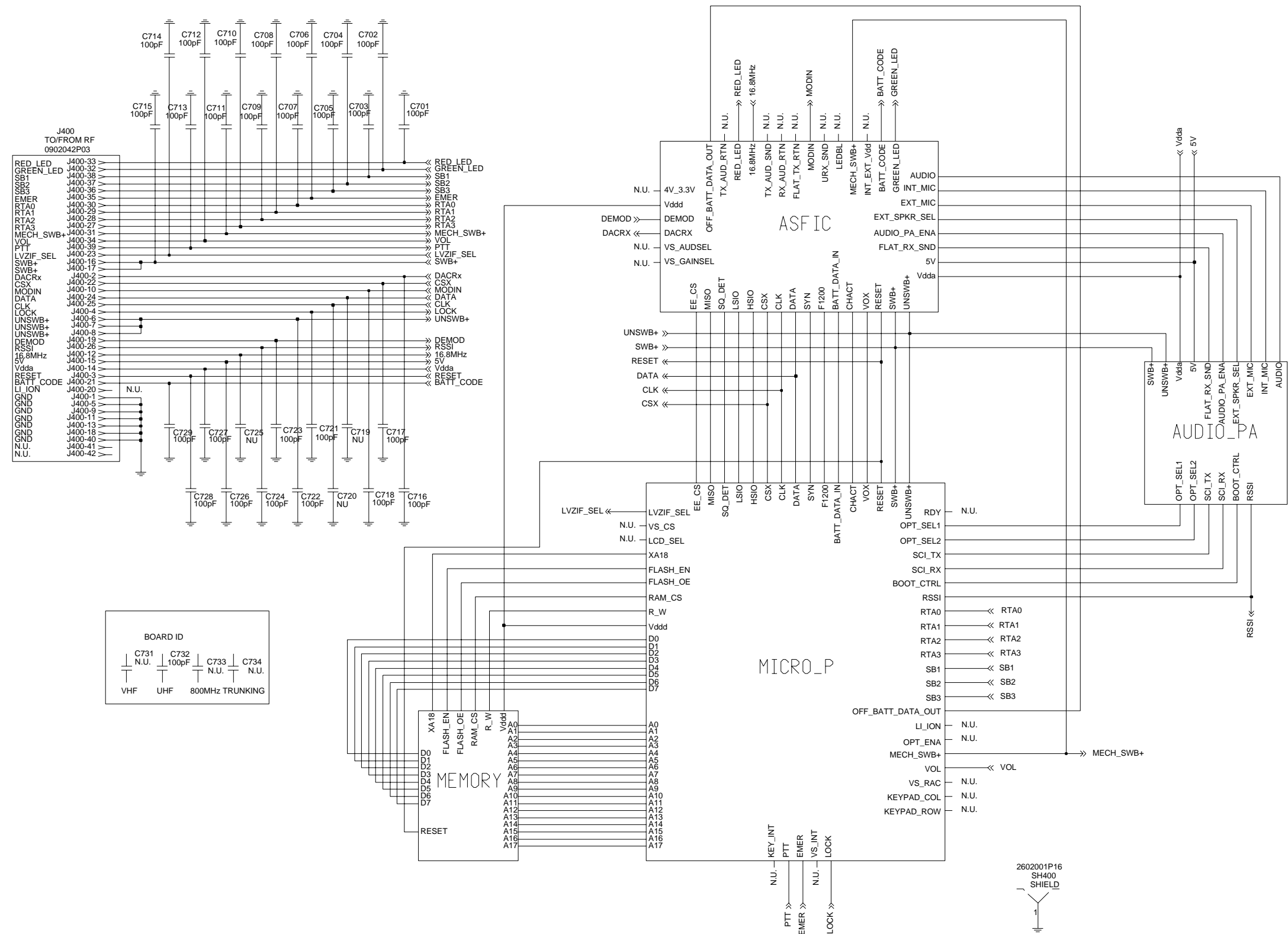


Figure 5-11: Complete Controller Schematic Diagram

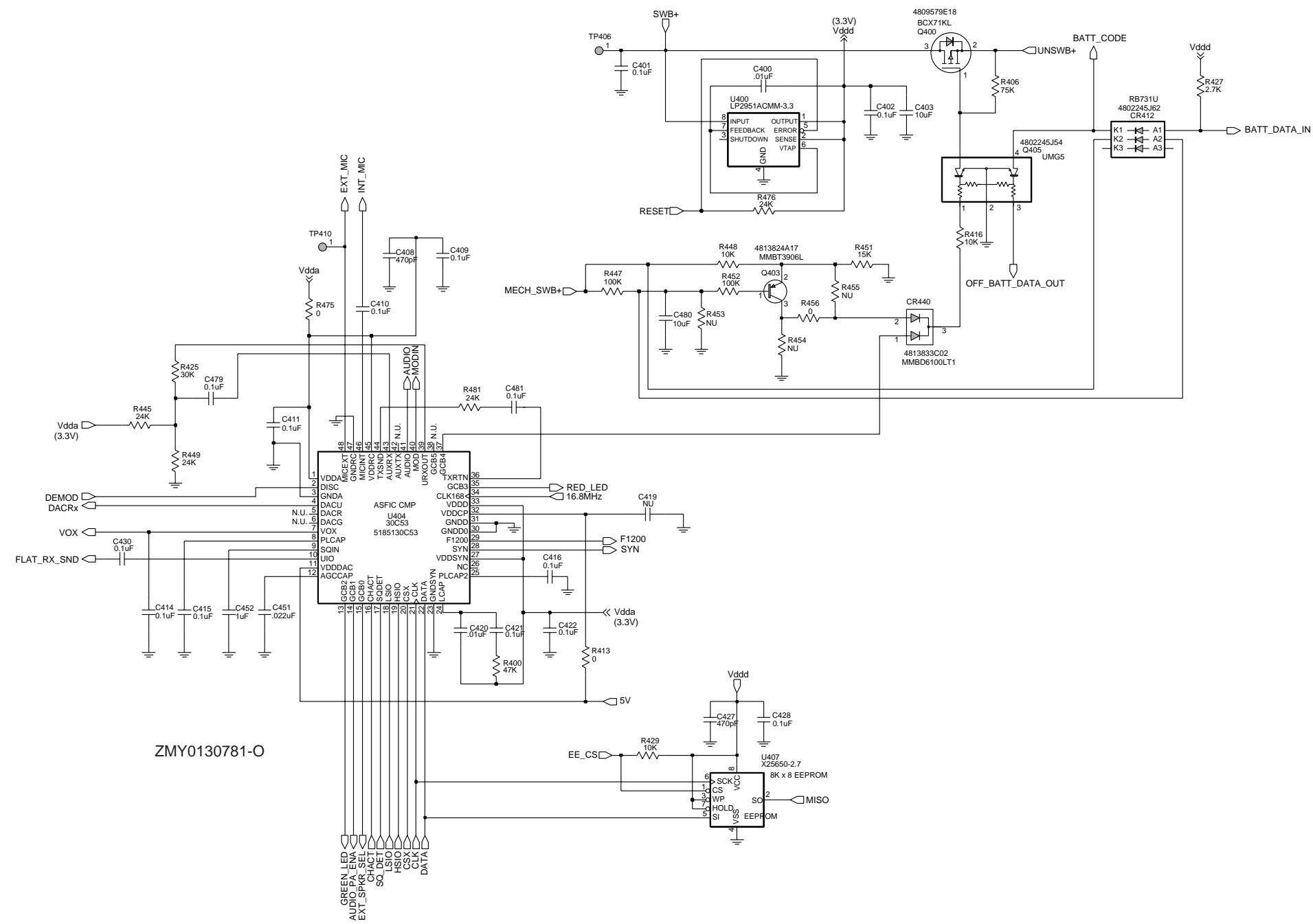


Figure 5-12: Controller ASIF/ON_OFF Schematic Diagram



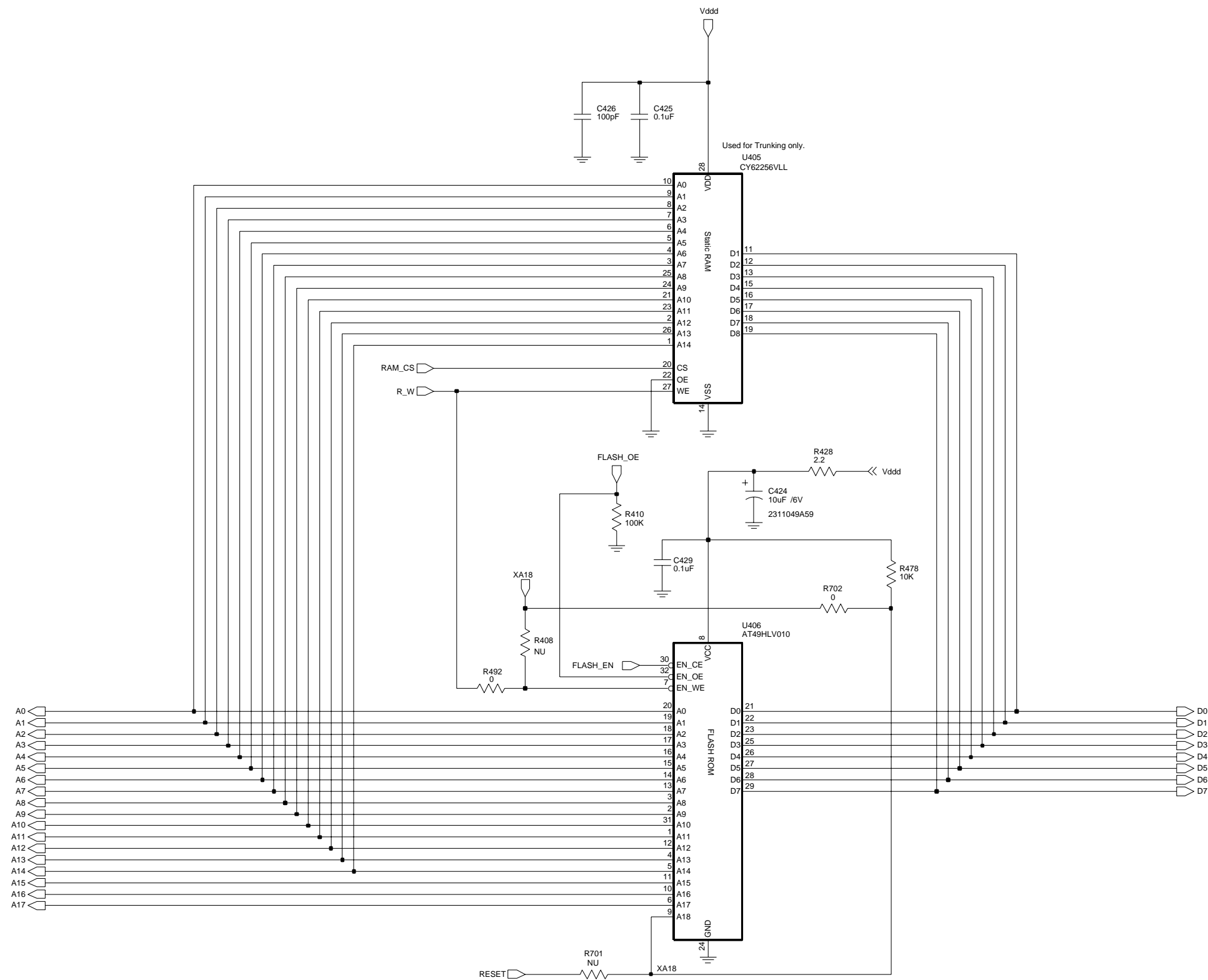


Figure 5-14: Controller Memory Schematic Diagram

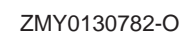


Figure 5-15: Controller Audio Power Amplifier Schematic Diagram

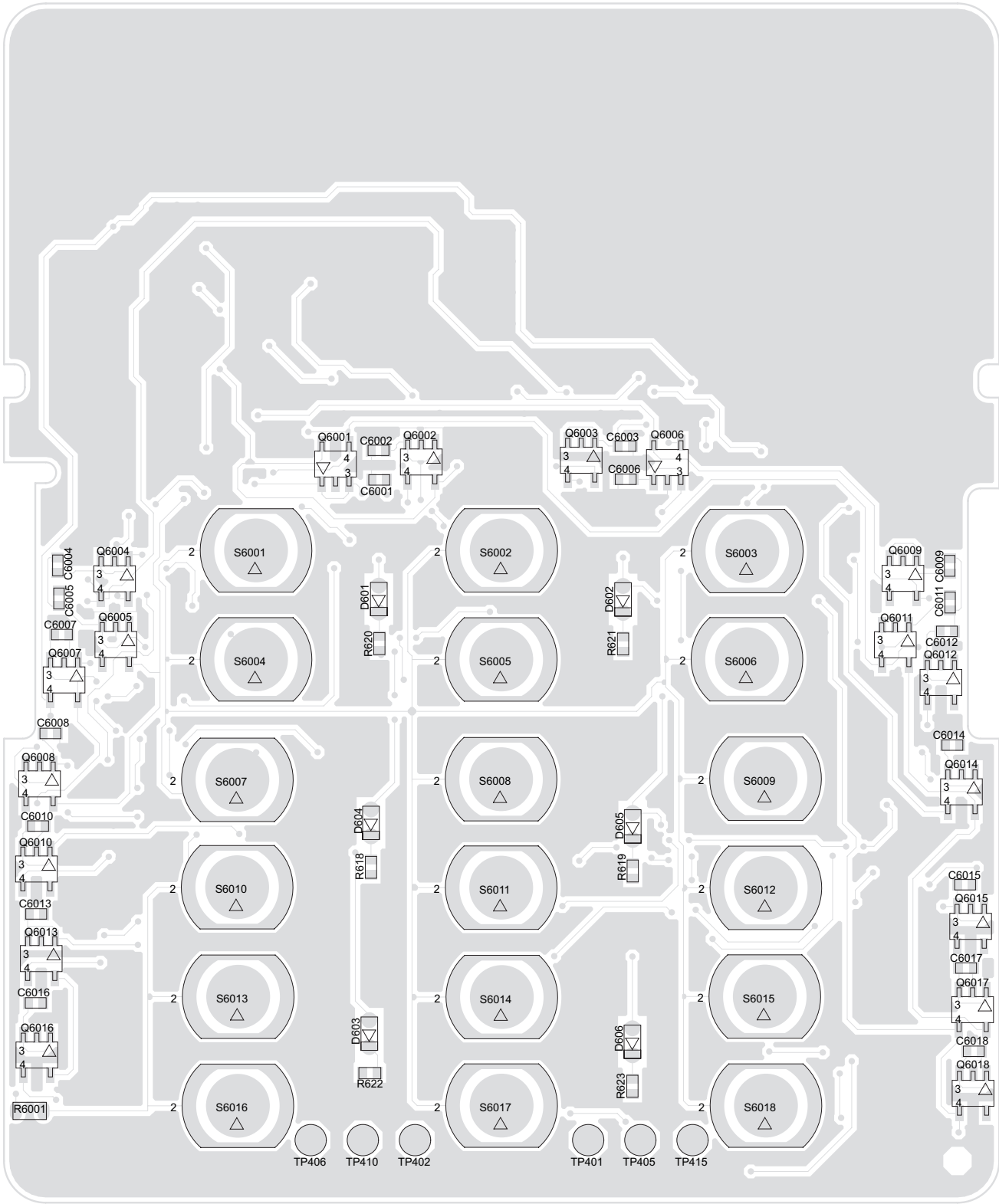


Figure 5-16: Controller Board Top View (PCB No. 8471678L01)

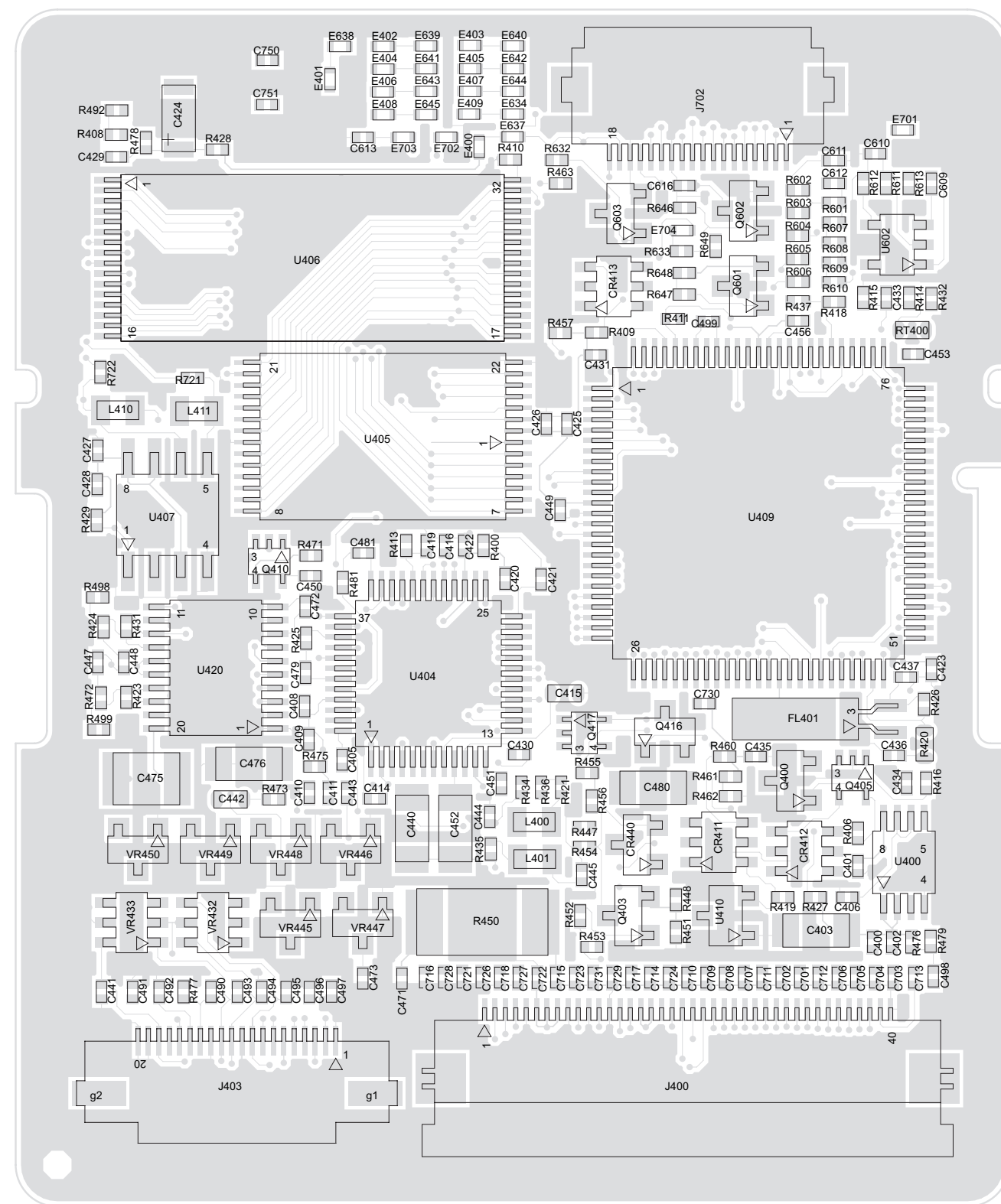


Figure 5-17: Controller Board Bottom View (PCB No. 8471678L01)

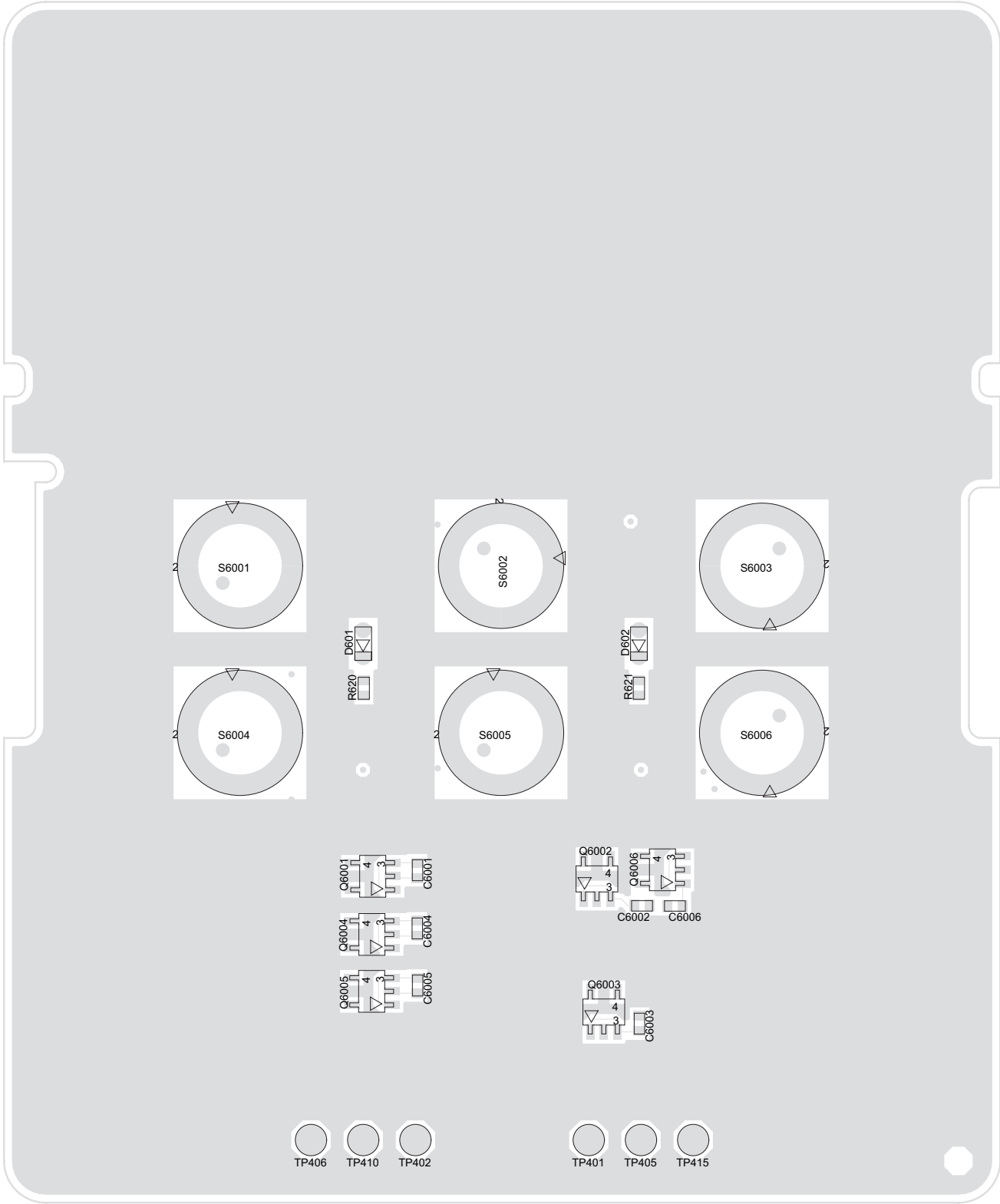


Figure 5-18: Controller Board Top View (PCB No. 8471679L01)

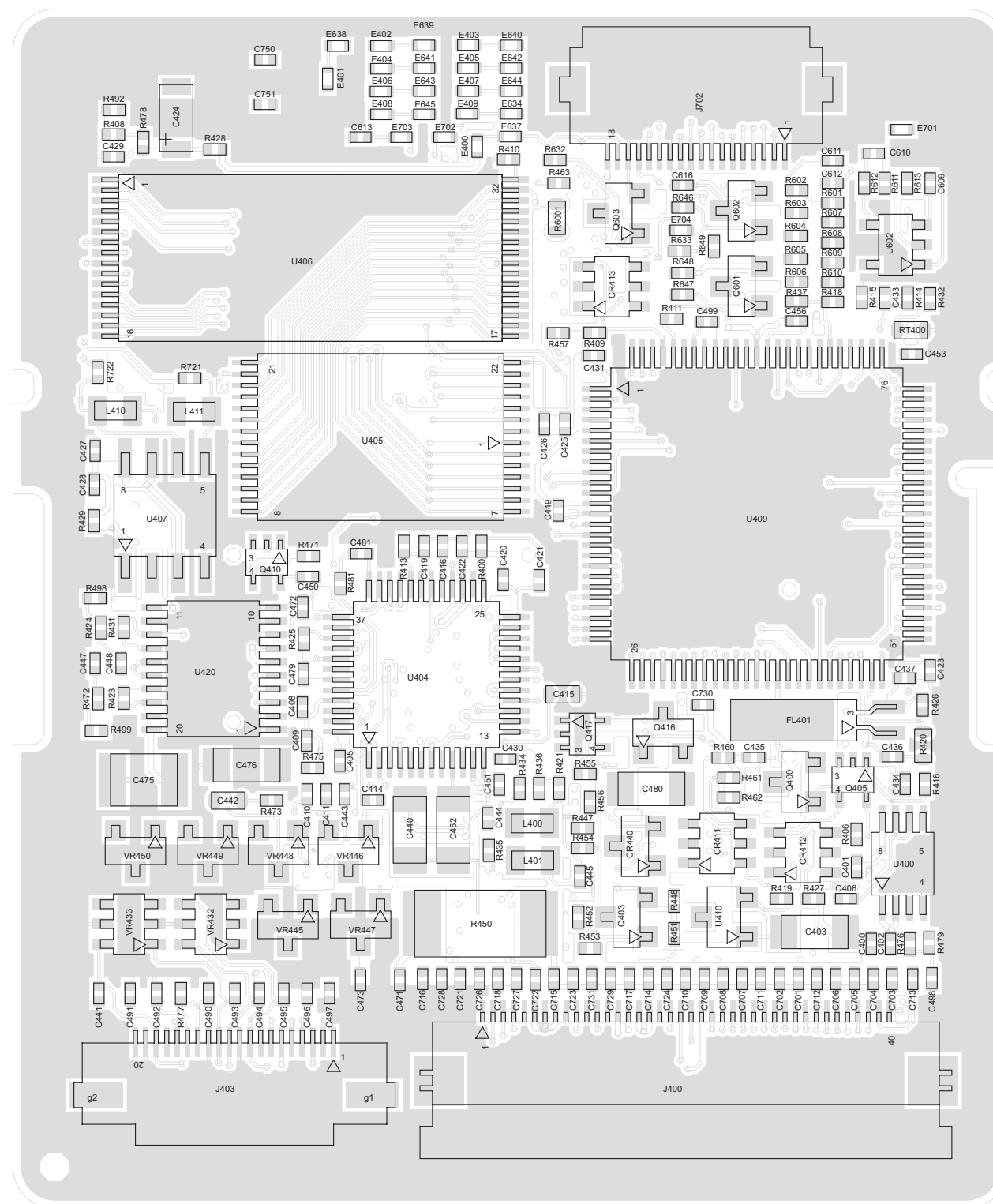


Figure 5-19: Controller Board Bottom View (PCB No. 8471679L01)

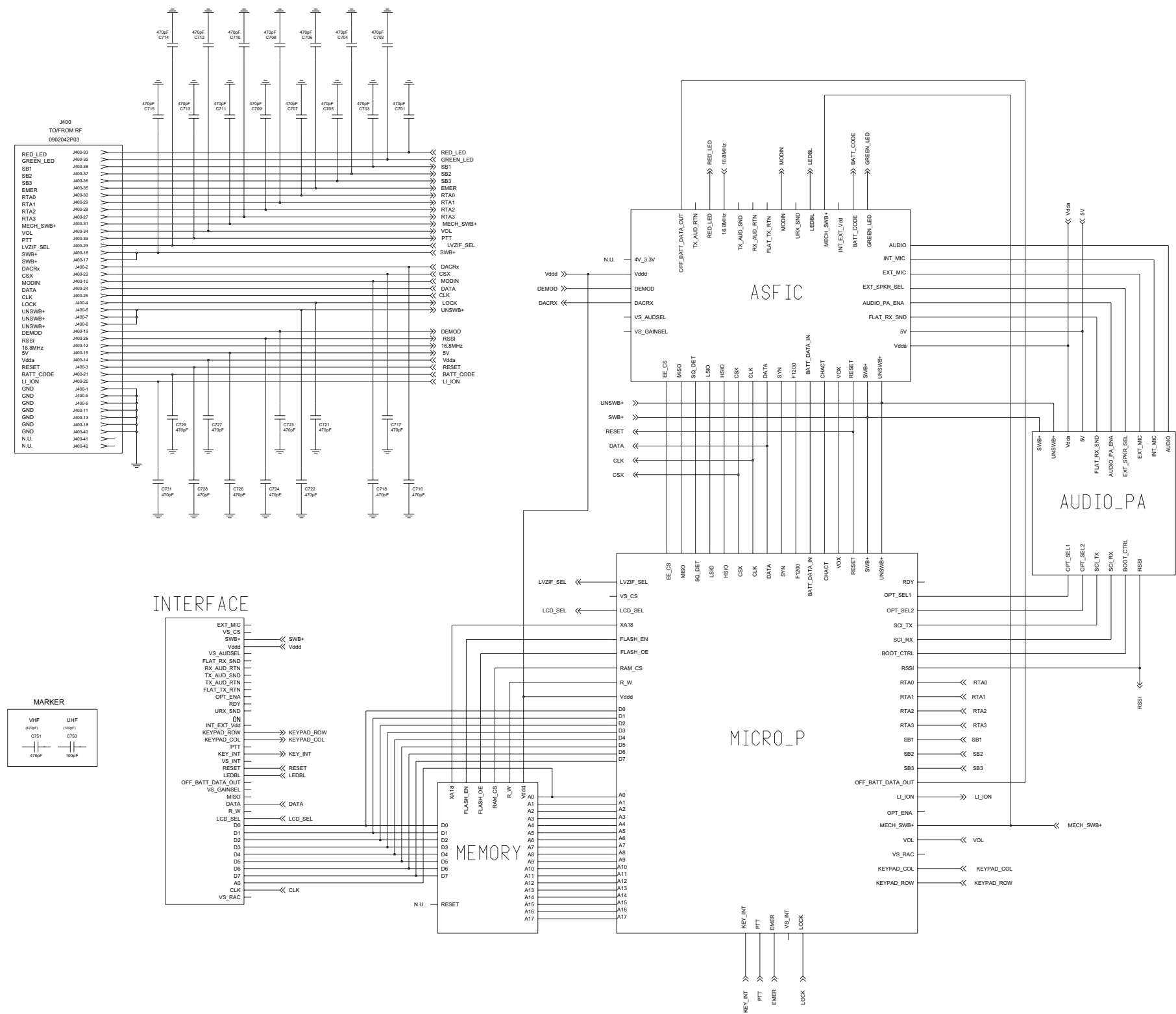


Figure 5-20: Complete Controller Schematic Diagram (PCB No. 8471678L01/ 8471679L01)

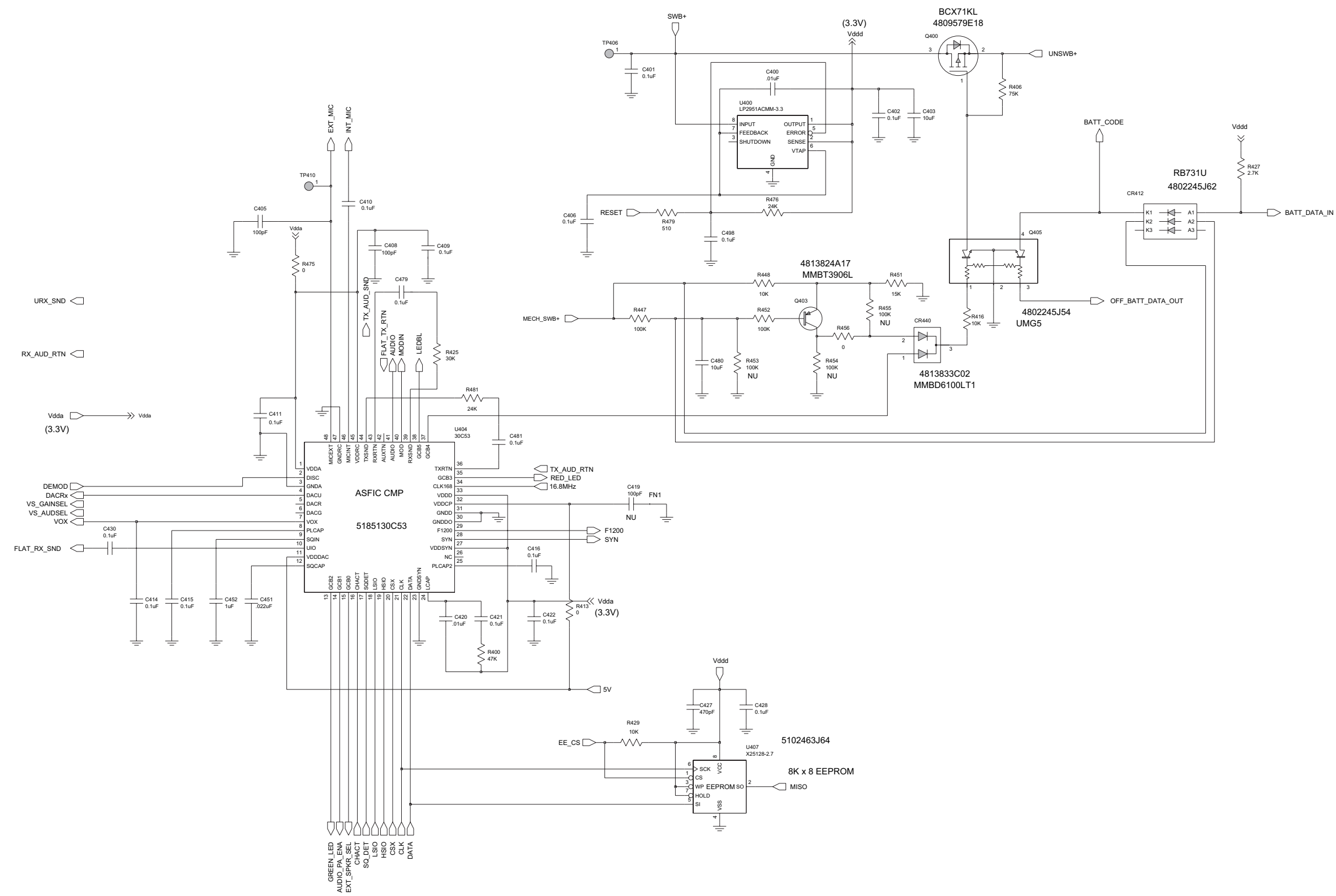


Figure 5-21: Controller ASFIC/ON_OFF Schematic Diagram (PCB No. 8471678L01/ 8471679L01)

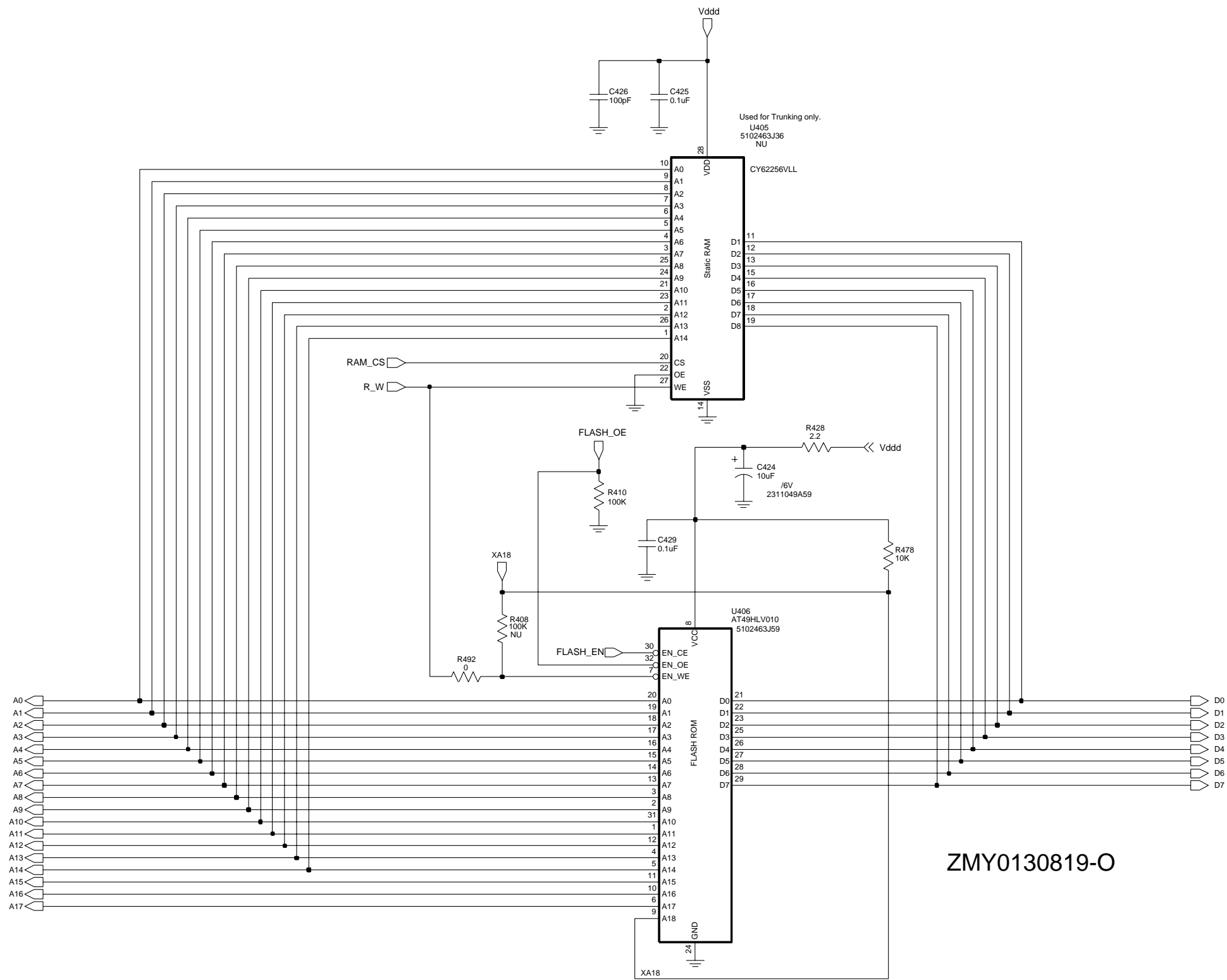


Figure 5-23: Controller Memory Schematic Diagram (PCB No. 8471678L01/ 8471679L01)

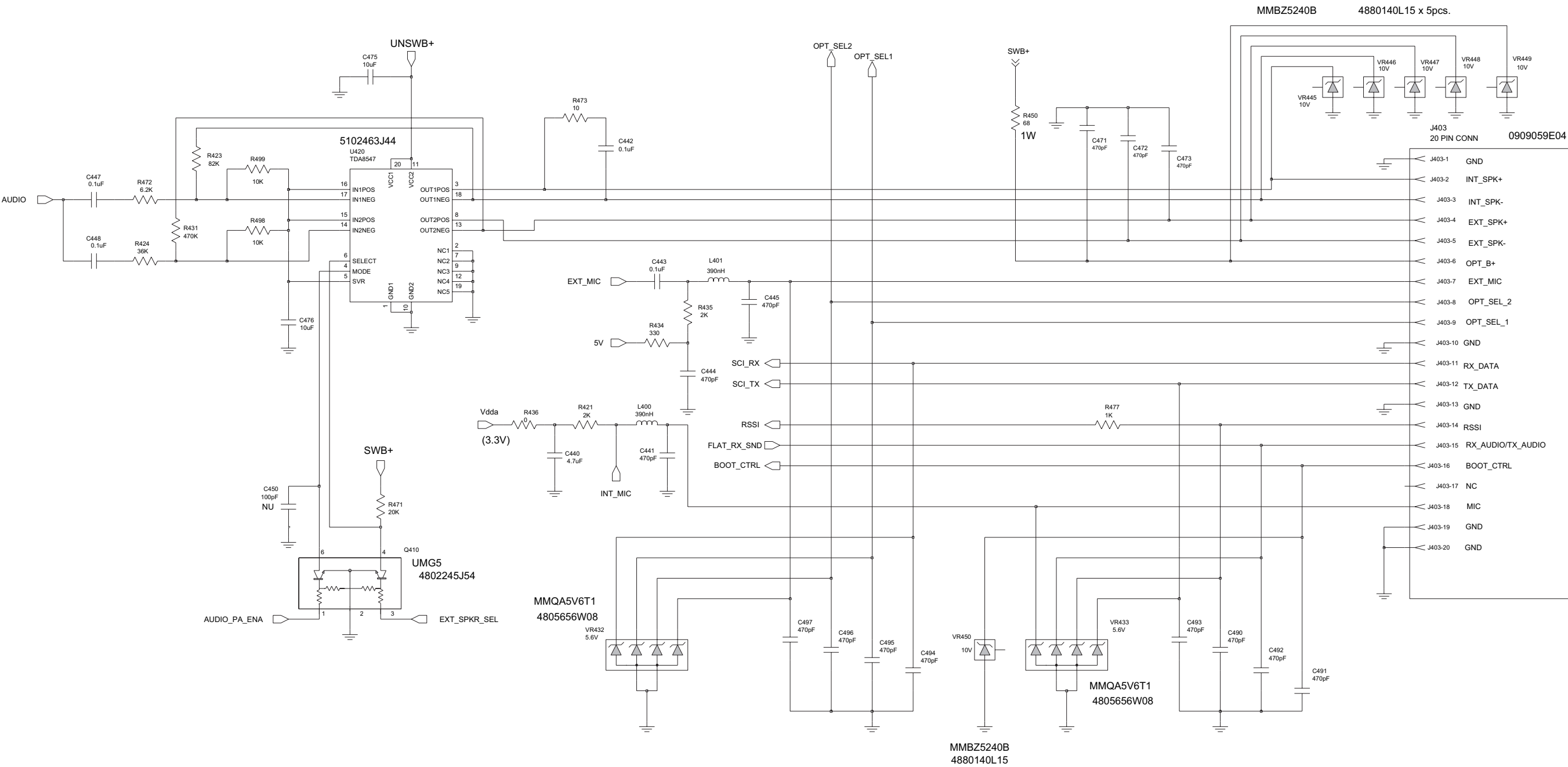


Figure 5-24: Controller Audio Power Amplifier Schematic Diagram (PCB No. 8471678L01/ 8471679L01)

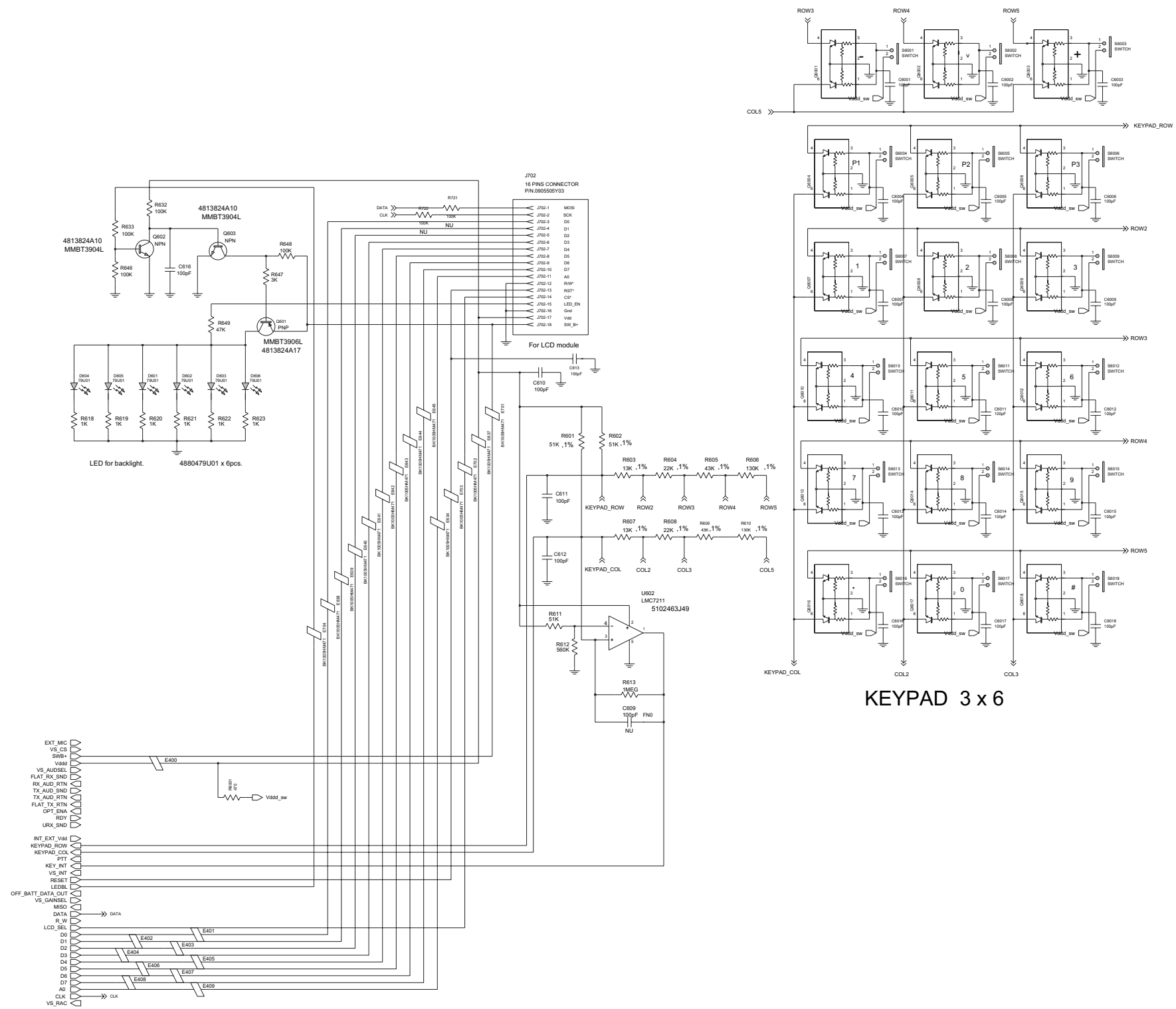


Figure 5-25: Controller Interface Schematic Diagram (PCB No. 8471678L01)

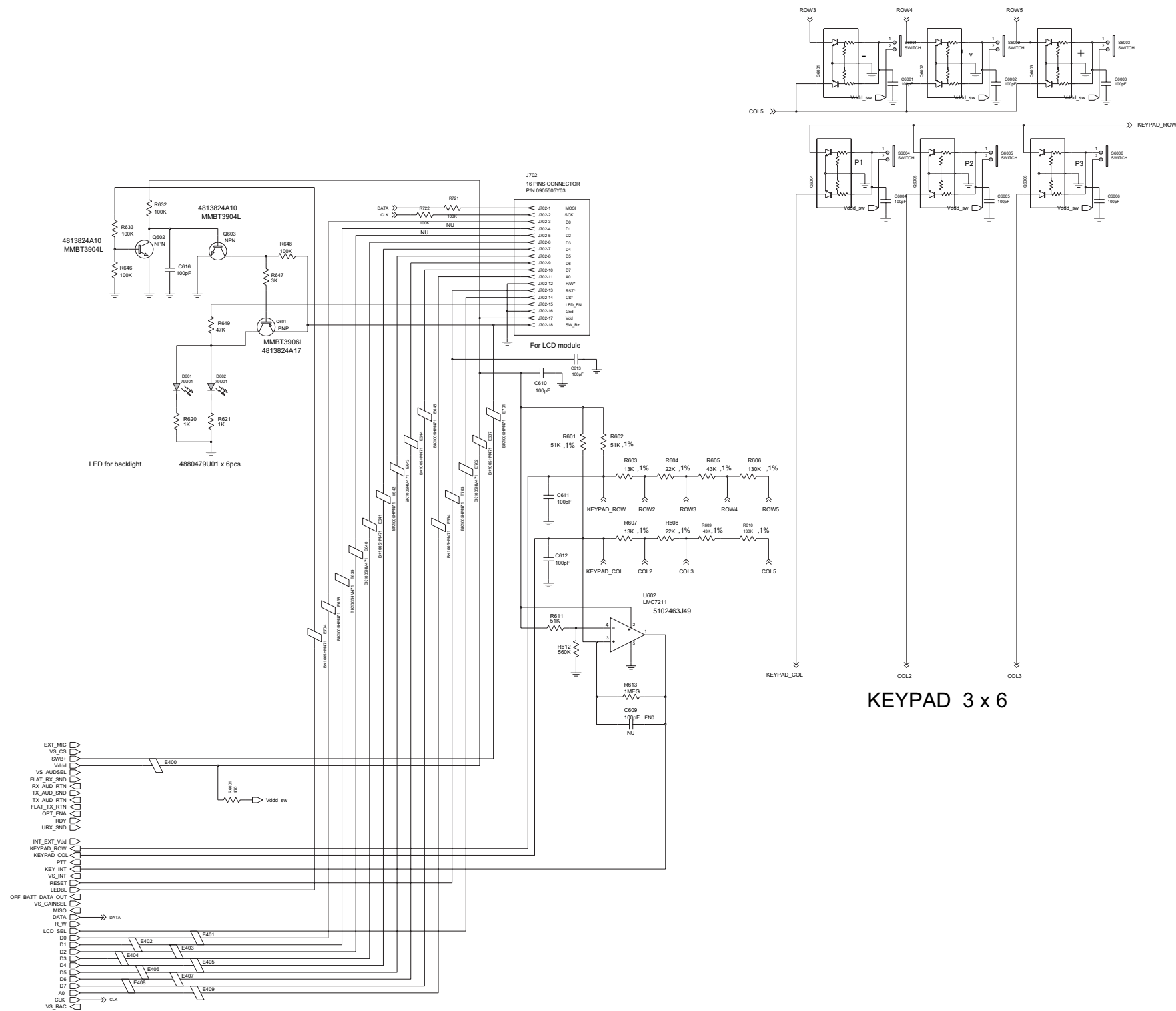


Figure 5-26: Controller Interface Schematic Diagram (PCB No. 8471679L01)

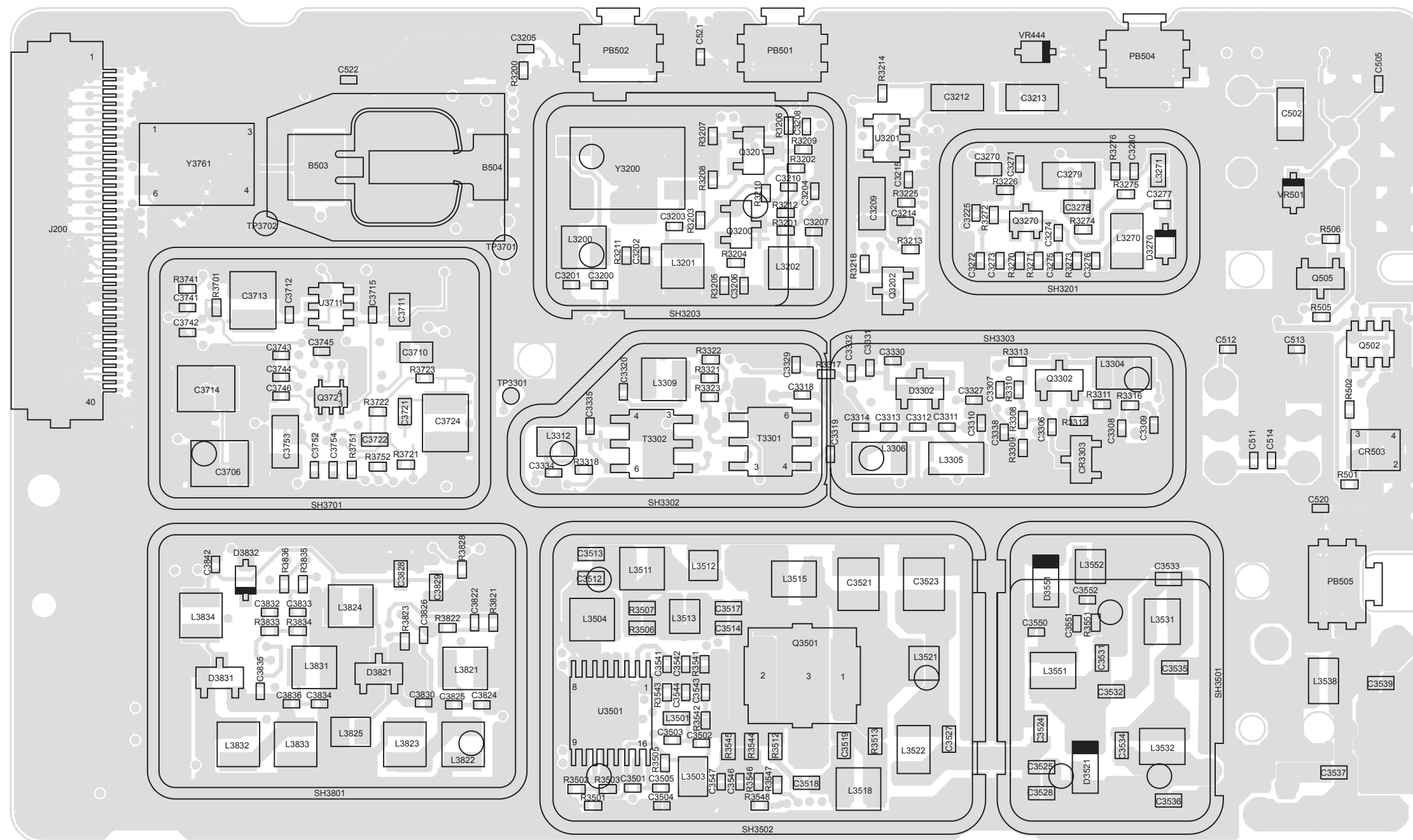


Figure 6-1: VHF (136-174MHz) Main Board Top Side PCB No. 8486062B12



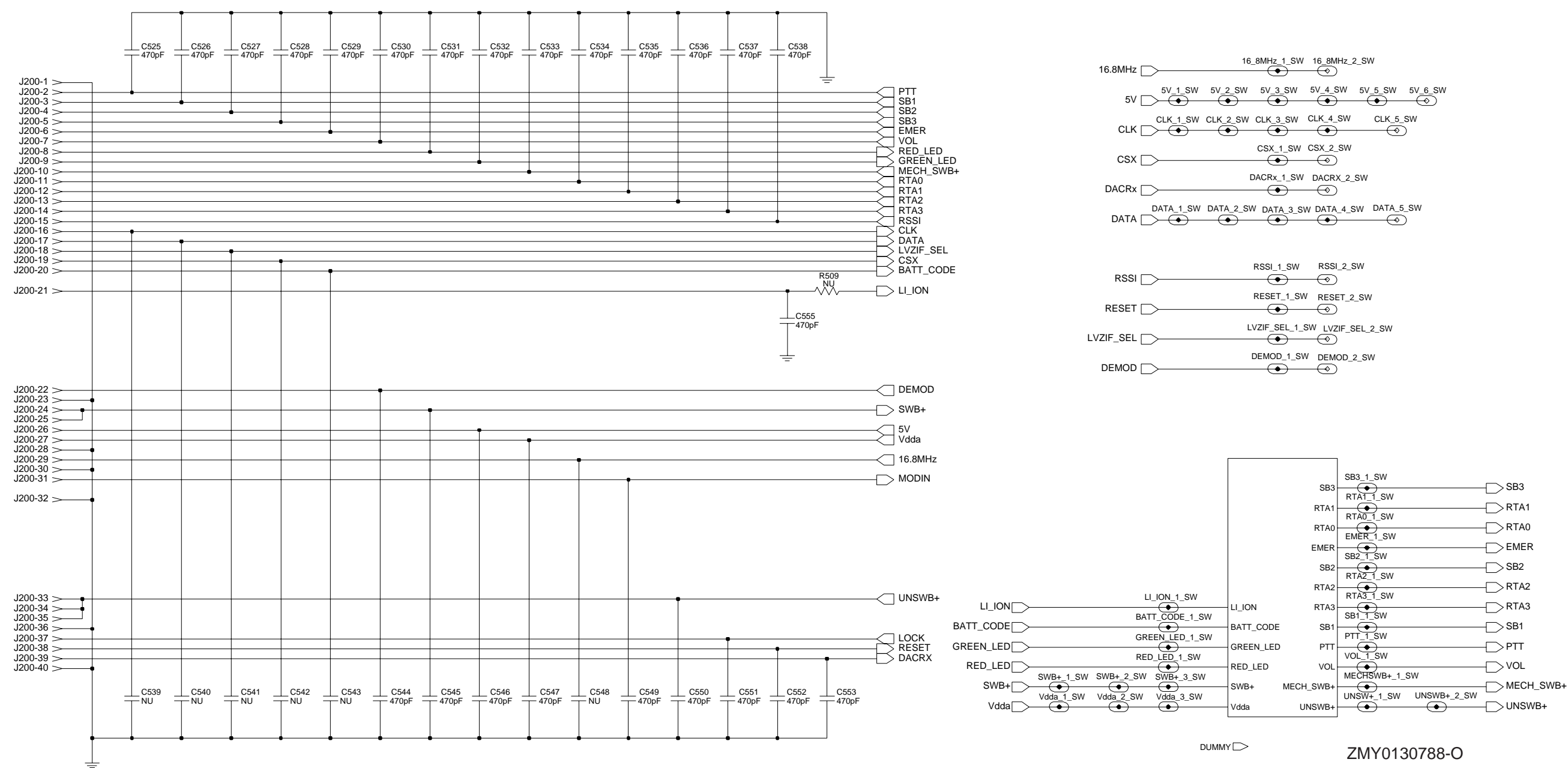


Figure 6-3: VHF Controls And Switches Schematic Diagram

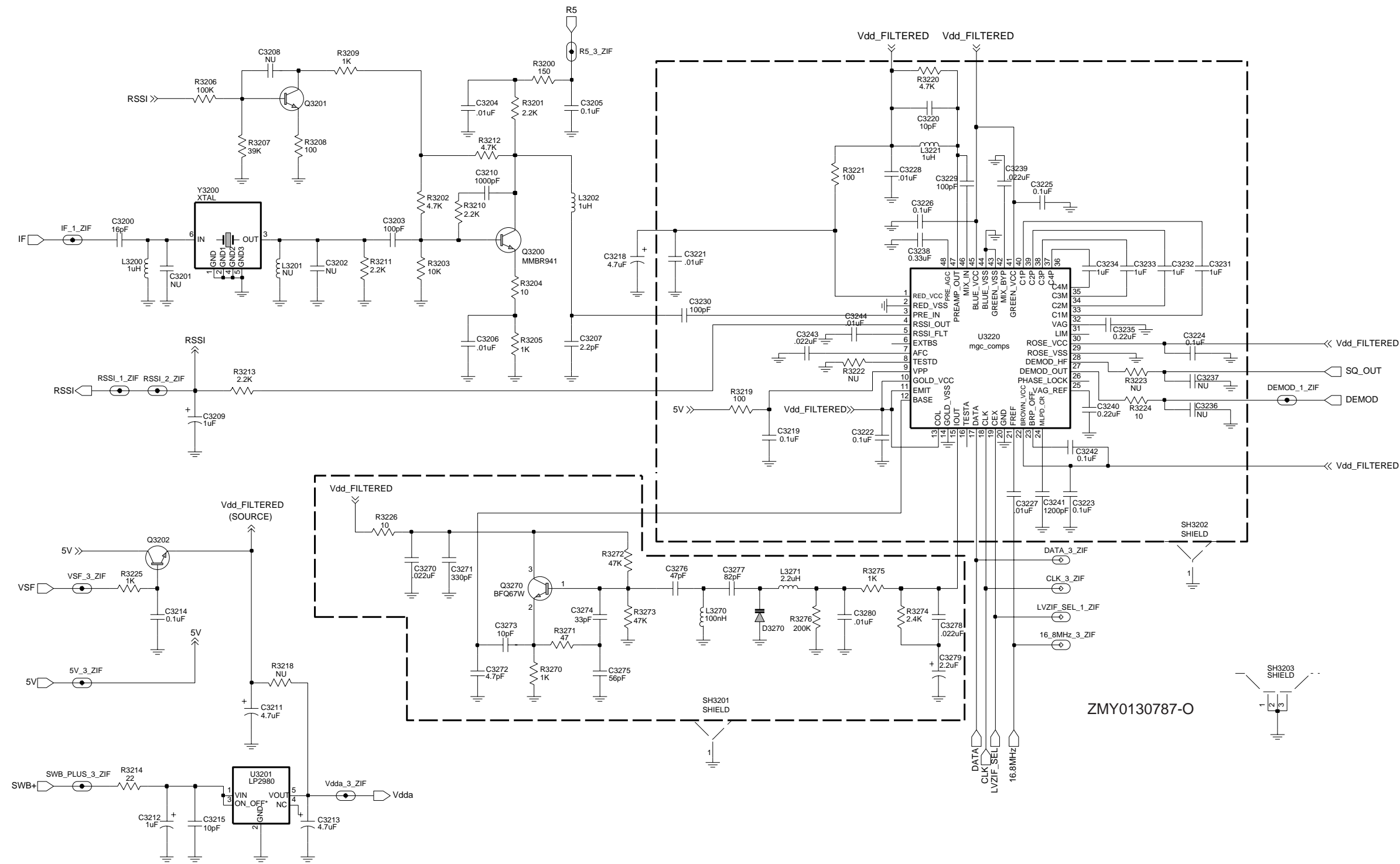


Figure 6-5: VHF Receiver Back End Schematic Diagram

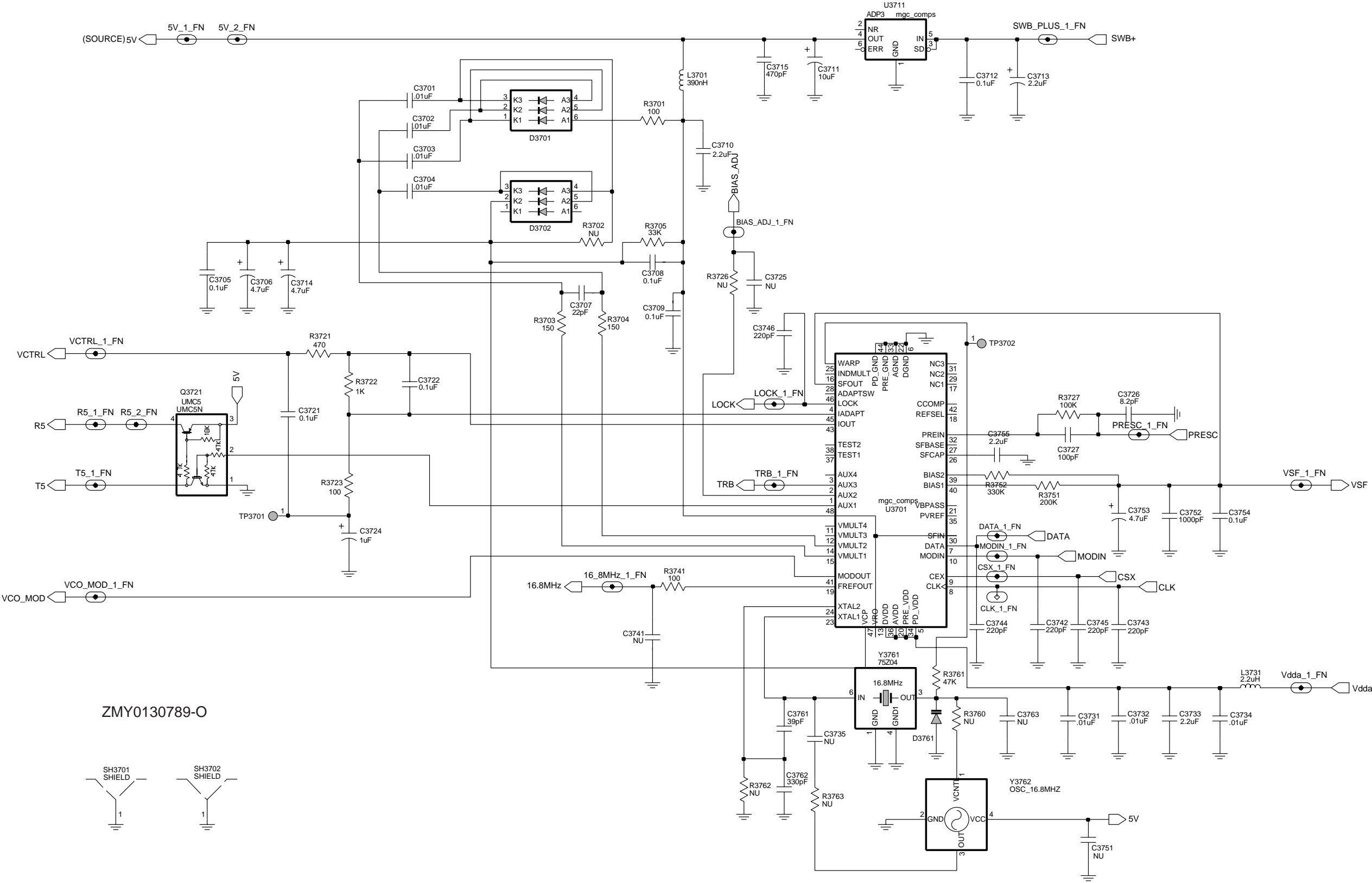


Figure 6-6: VHF Synthesizer Schematic Diagram

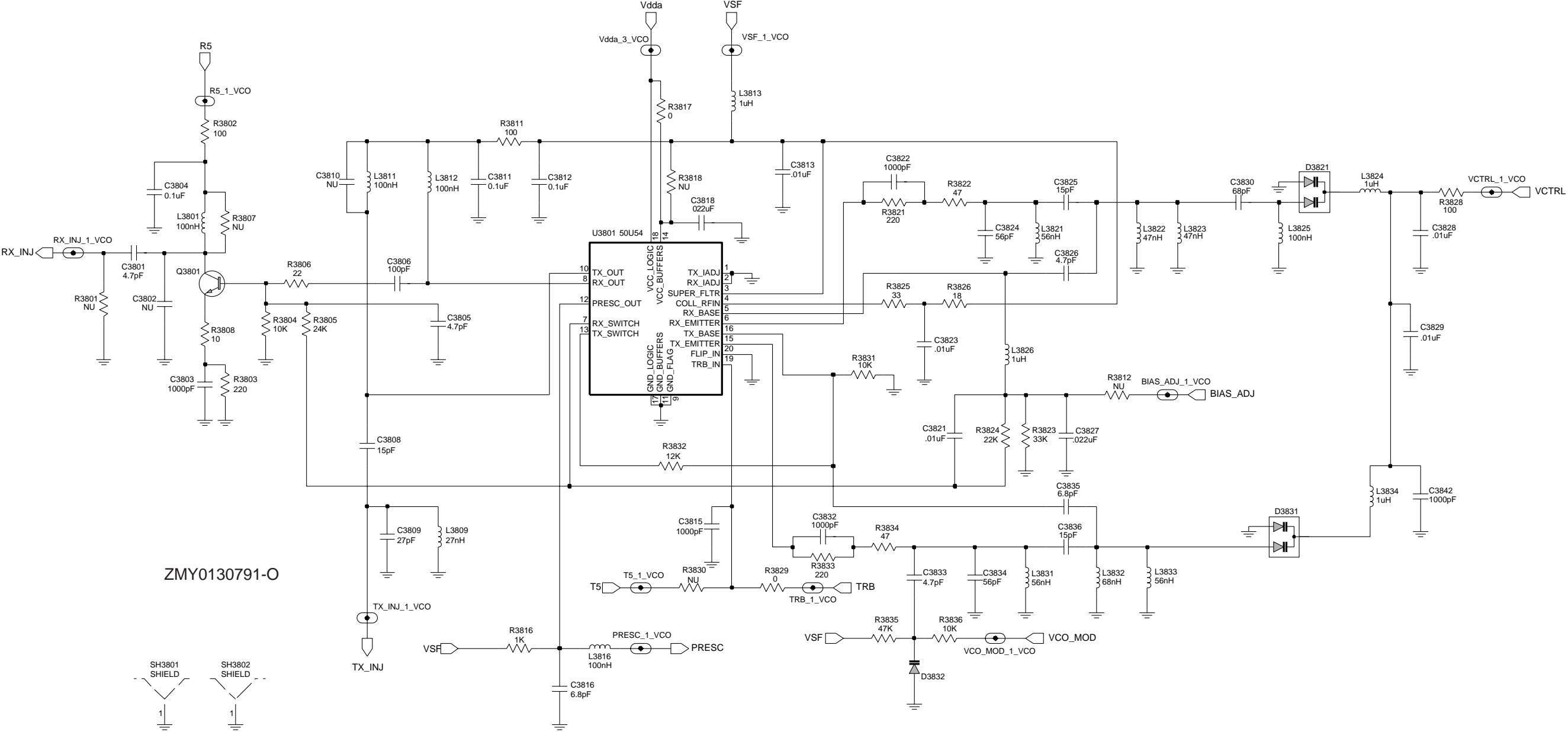


Figure 6-7: VHF Voltage Controlled Oscillator Schematic Diagram

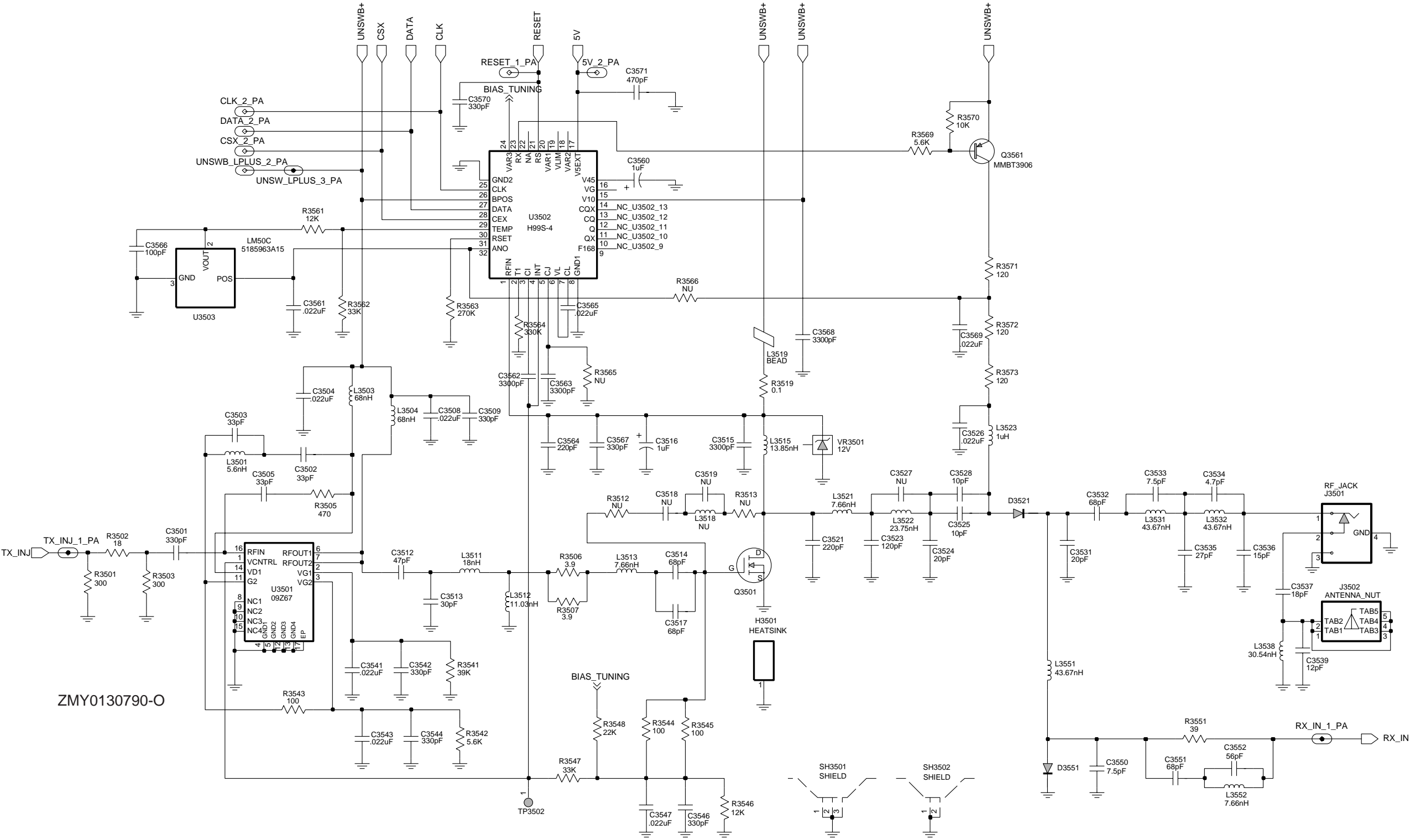


Figure 6-8: VHF Transmitter Schematic Diagram

VHF Radio Parts List

Circuit Ref	Motorola Part No.	Description
B501	0986237A02	Battery Contact Module
C3200	2113743N31	16.0pF
C3203	2113743N50	100pF
C3204	2113743L41	0.01uF
C3205	2113928N01	0.1uF
C3206	2113743L41	0.01uF
C3207	2113743N10	2.2pF
C3209	2311049A07	1uF
C3210	2113743L17	1000pF
C3211	2311049A56	4.7uF
C3212	2311049A07	1uF
C3213	2311049A56	4.7uF
C3214	2113928N01	0.1uF
C3215	2113743N26	10pF
C3218	2311049A56	4.7uF
C3219	2113928N01	0.1uF
C3220	2113743N26	10pF
C3221	2113743L41	0.01uF
C3222	2113928N01	0.1uF
C3223	2113928N01	0.1uF
C3224	2113928N01	0.1uF
C3225	2113928N01	0.1uF
C3226	2113928N01	0.1uF
C3227	2113743L41	0.01uF
C3228	2113743L41	0.01uF
C3229	2113743N50	100pF
C3230	2113740F51	100pF
C3231	2180478Z20	1uF
C3232	2180478Z20	1uF
C3233	2180478Z20	1uF
C3234	2180478Z20	1uF
C3235	2113743A23	0.220uF
C3238	2113743A24	0.330uF
C3239	2113743E07	0.022uF
C3240	2113743A23	0.220uF
C3241	2113743L19	1200pF
C3242	2109720D14	0.1uF
C3243	2113743E07	0.022uF
C3244	2113743L41	0.01uF
C3270	2113743E07	0.022uF
C3271	2113743L05	330pF
C3272	2113743N18	4.7pF
C3273	2113743N26	10pF
C3274	2113743N38	33pF
C3275	2113743N44	56pF
C3276	2113743N42	47.0pF
C3277	2113743N48	82.0pF
C3278	2113743E07	0.022uF
C3279	2311049A40	2.2uF

Circuit Ref	Motorola Part No.	Description
C3280	2113743L41	0.01uF
C3301	2113743N20	5.6pF
C3302	2113743N54	150pF
C3303	2113743N30	15.0pF
C3304	2113743N54	150pF
C3306	2113928N01	0.1uF
C3307	2113743N50	100pF
C3308	2113743L05	330pF
C3309	2113928N01	0.1uF
C3311	2113743N54	150pF
C3312	2113743N31	16.0pF
C3313	2113743N54	150pF
C3315	2113743N26	10pF
C3316	2113743N14	3.3pF
C3317	2113743N40	39.0pF
C3318	2113743M08	0.022uF
C3320	2113743N48	82.0pF
C3321	2113743L05	330pF
C3322	2113743N50	100pF
C3323	2113743N50	100pF
C3324	2113743N38	33pF
C3325	2113743L17	1000pF
C3327	2113743L05	330pF
C3329	2113743L05	330pF
C3330	2113743N50	100pF
C3331	2113743N50	100pF
C3332	2113743N40	39.0pF
C3334	2113743N33	20pF
C3335	2113743N34	22pF
C3336	2311049A18	10uF
C3337	2113743M08	0.022uF
C3338	2113743L09	470pF
C3339	2113743N26	10pF
C3501	2113743L05	330pF
C3502	2113743N38	33pF
C3503	2113743N38	33pF
C3504	2113743M08	0.022uF
C3505	2113743N38	33pF
C3508	2113743M08	0.022uF
C3509	2113743L05	330pF
C3512	2113740F43	47pF
C3513	2113740F38	30pF
C3514	2113740F67	470pF
C3515	2113743L29	3300pF
C3516	2311049A08	1uF
C3517	2113740F51	100pF
C3518	2113740F63	330pF
C3519	2113740F35	22pF
C3521	2111078B51	220pF
C3523	2111078B44	120pF
C3524	2113740F33	18pF

Circuit Ref	Motorola Part No.	Description
C3525	2113740F27	10pF
C3526	2113743M08	0.022uF
C3528	2113740F26	9.1pF
C3531	2113740F34	20pF
C3532	2113740F47	68pF
C3533	2113740F24	7.5pF
C3534	2113740F19	4.7pF
C3535	2113740F37	27pF
C3536	2113740F31	15pf
C3537	2113740F33	18pF
C3539	2113740F21	5.6pF
C3541	2113743M08	0.022uF
C3542	2113743L05	330pF
C3543	2113743M08	0.022uF
C3544	2113743L05	330pF
C3546	2113743L05	330pF
C3547	2113743M08	0.022uF
C3550	2113743N23	7.5pF
C3551	2113743N46	68.0pF
C3552	2113743N44	56pF
C3560	2311049A07	1uF
C3561	2113743M08	0.022uF
C3562	2113743L29	3300pF
C3563	2113743L29	3300pF
C3564	2113743L01	220pF
C3565	2113743E07	0.022uF
C3566	2113743N50	100pF
C3567	2113743L05	330pF
C3568	2113743L29	3300pF
C3569	2113743M08	0.022uF
C3570	2113743L05	330pF
C3571	2113743L09	470pF
C3701	2113743L41	0.01uF
C3702	2113743L41	0.01uF
C3703	2113743L41	0.01uF
C3704	2113743L41	0.01uF
C3705	2113743E20	10uF
C3706	2311049J11	4.7uF
C3707	2113743N34	22pF
C3708	2113743M24	0.1uF
C3709	2113743M24	0.1uF
C3710	2104993J02	2.2uF
C3711	2311049A69	10uF
C3712	2113743M24	0.1uF
C3713	2311049A09	2.2uF
C3714	2311049J11	4.7uF
C3715	2113743L09	470pF
C3721	2113743E20	10uF
C3722	2113743E20	10uF
C3724	2311049A08	1uF
C3726	2113743N24	8.2pF

Circuit Ref	Motorola Part No.	Description
C3727	2113743N50	100pF
C3731	2113743L41	0.01uF
C3732	2113743L41	0.01uF
C3733	2104993J02	2.2uF
C3734	2113743L41	0.01uF
C3742	2113743L01	220pF
C3743	2113743L01	220pF
C3744	2113743L01	220pF
C3745	2113743L01	220pF
C3746	2113743L01	220pF
C3752	2113743L17	1000pF
C3753	2311049A56	4.7uF
C3754	2113743M24	0.1uF
C3755	2104993J02	2.2uF
C3761	2113743N40	39pF
C3762	2113740F63	330pF
C3763	2113743N08	1.6pF
C3801	2113743N18	4.7pF
C3803	2113743L17	1000pF
C3804	2113743E20	10uF
C3805	2113743N18	4.7pF
C3806	2113743N50	100pF
C3808	2113743N30	15.0pF
C3809	2113743N36	27pF
C3811	2113743M24	0.1uF
C3812	2113743M24	0.1uF
C3813	2113743L41	0.01uF
C3815	2113743L17	1000pF
C3816	2113743N22	6.8pF
C3818	2113743E07	0.022uF
C3821	2113743L41	0.01uF
C3822	2113743L17	1000pF
C3823	2113743L41	0.01uF
C3824	2113743N44	56pF
C3825	2113743N30	15.0pF
C3826	2113743N18	4.7pF
C3827	2113743E07	0.022uF
C3828	2109720D01	0.01uF
C3829	2109720D01	0.01uF
C3830	2113743N46	68.0pF
C3832	2113743L17	1000pF
C3833	2113743N18	4.7pF
C3834	2113743N44	56pF
C3835	2113743N22	6.8pF
C3836	2113743N30	15.0pF
C3842	2113743L17	1000pF
C400	2113743L41	0.01uF,10%
C401	2113743M24	0.1uF +80-20%
C402	2113743M24	0.1uF +80-20%
C403	2113928D08	10uF
C408	2113743L09	470 pF 10%

Circuit Ref	Motorola Part No.	Description
C409	2113743M24	0.1uF +80-20%
C410	2113928N01	0.1uF 10%
C411	2113743M24	0.1uF +80-20%
C414	2113743M24	0.1uF +80-20%
C415	2185895Z01	0.1uF
C416	2113928N01	0.1uF 10%
C420	2113743L41	0.01uF,10%
C421	2113928N01	0.1uF 10%
C422	2113743M24	0.1uF +80-20%
C423	2113743L09	470 pF 10%
C424	2311049A59	10UF 10%
C425	2113743M24	0.1uF +80-20%
C426	2113743L09	470 pF 10%
C427	2113743L09	470 pF 10%
C428	2113743M24	0.1uF +80-20%
C429	2113743M24	0.1uF +80-20%
C430	2113928N01	0.1uF 10%
C431	2113743L09	470 pF 10%
C433	2113743L41	0.01uF,10%
C435	2113743M24	0.1uF +80-20%
C440	2113743G26	4.7uF
C441	2113743L09	470 pF 10%
C442	2113743E20	10uF
C443	2113928N01	0.1uF 10%
C444	2113743L09	470 pF 10%
C445	2113743L09	470 pF 10%
C447	2113928N01	0.1uF 10%
C448	2113928N01	0.1uF 10%
C449	2113743L09	470 pF 10%
C451	2113743M08	0.022uF,80%/-20%
C452	2113743B29	1.00 UF
C453	2113743L09	470 pF 10%
C456	2113743L09	470 pF 10%
C471	2113743L09	470 pF 10%
C472	2113743L09	470 pF 10%
C473	2113743L09	470 pF 10%
C475	2113743H14	10.0uF
C476	2113928D08	10uF
C479	2113928N01	0.1uF 10%
C480	2113928D08	10uF
C481	2113928N01	0.1uF 10%
C490	2113743L09	470 pF 10%
C491	2113743L09	470 pF 10%
C492	2113743L09	470 pF 10%
C493	2113743L09	470 pF 10%
C494	2113743L09	470 pF 10%
C495	2113743L09	470 pF 10%
C496	2113743L09	470 pF 10%
C497	2113743L09	470 pF 10%
C502	2311049A05	0.47uF,10%
C503	2113743N50	100pF

Circuit Ref	Motorola Part No.	Description
C505	2113743N50	100pF
C511	2113743N50	100pF
C512	2113743N50	100pF
C513	2113743N50	100pF
C514	2113743N50	100pF
C520	2113743L41	0.01uF
C521	2113743L41	0.01uF
C522	2113743L41	0.01uF
C523	2113743L41	0.01uF
C525	2113743L09	470pF
C526	2113743L09	470pF
C527	2113743L09	470pF
C528	2113743L09	470pF
C529	2113743L09	470pF
C530	2113743L09	470pF
C531	2113743L09	470pF
C532	2113743L09	470pF
C533	2113743L09	470pF
C534	2113743L09	470pF
C535	2113743L09	470pF
C536	2113743L09	470pF
C537	2113743L09	470pF
C538	2113743L09	470pF
C544	2113743L09	470pF
C545	2113743L09	470pF
C546	2113743L09	470pF
C547	2113743L09	470pF
C549	2113743L09	470pF
C550	2113743L09	470pF
C551	2113743L09	470pF
C552	2113743L09	470pF
C553	2113743L09	470pF
C555	2113743L09	470pF
C701	2113743L09	470 pF 10%
C702	2113743L09	470 pF 10%
C703	2113743L09	470 pF 10%
C704	2113743L09	470 pF 10%
C705	2113743L09	470 pF 10%
C706	2113743L09	470 pF 10%
C707	2113743L09	470 pF 10%
C708	2113743L09	470 pF 10%
C709	2113743L09	470 pF 10%
C710	2113743L09	470 pF 10%
C711	2113743L09	470 pF 10%
C712	2113743L09	470 pF 10%
C713	2113743L09	470 pF 10%
C714	2113743L09	470 pF 10%
C715	2113743L09	470 pF 10%
C716	2113743L09	470 pF 10%
C717	2113743L09	470 pF 10%
C718	2113743L09	470 pF 10%

Circuit Ref	Motorola Part No.	Description
C721	2113743L09	470 pF 10%
C722	2113743L09	470 pF 10%
C723	2113743L09	470 pF 10%
C724	2113743L09	470 pF 10%
C726	2113743L09	470 pF 10%
C727	2113743L09	470 pF 10%
C728	2113743L09	470 pF 10%
C729	2113743L09	470 pF 10%
C730	2113743L09	470 pF 10%
C731	2113743L09	470 pF 10%
CR3301	4802245J42	Ring Quad Diode
CR3302	4805129M96	SMBV1032
CR3303	4880154K03	Dual Common Anode-Cathode
CR411	4802245J47	Schottky Diode
CR412	4802245J62	Schottky Diode
CR413	4802245J62	Schottky Diode
CR440	4813833C02	Dual Diode Common Cathode
CR501	4880107R01	Rectifier
CR503	4805729G49	LED Red/Yel
D3270	4862824C01	Varactor
D3301	4802081B58	Diode Dual
D3302	4802081B58	Diode Dual
D3521	4880973Z02	Pin Diode
D3551	4880973Z02	Pin Diode
D3701	4802233J09	Triple Diode
D3702	4802233J09	Triple Diode
D3761	4862824C03	Varactor
D3821	4805649Q13	Dual Varactor
D3831	4805649Q13	Dual Varactor
D3832	4862824C01	Varactor
F501	6580542Z01	Fuse 3A
H3501	2680499Z01	HEATSINK
J200	0905505Y04	40 Pins Connector
J3501	0985613Z01	RF JACK
J3502	0280519Z02	Antenna Nut
J400	0902042P03	40 Pins Connector
J403	0909059E04	20 Pins Connector
L3200	2462587N68	1000nH
L3202	2462587N68	1000nH
L3221	2462587N68	1000nH
L3270	2462587T15	100nH
L3271	2462587Q20	2.2uH
L3301	2462587T35	2nH
L3303	2462587T35	2nH
L3304	2462587T23	470nH
L3305	2462587T35	2nH
L3306	2462587T35	2nH
L3308	2462587T34	10nH
L3309	2462587N55	150nH
L3312	2462587V28	33nH

Circuit Ref	Motorola Part No.	Description
L3501	2413926H09	5.6nH
L3503	2462587V32	68nH
L3504	2462587N51	68nH
L3511	2462587N44	18nH
L3512	2479990B01	11.03nH
L3513	2479990A02	7.66nH
L3515	2479990C03	13.85nH
L3518	2462587N48	39nH
L3519	2484657R01	BEAD
L3521	2479990A02	7.66nH
L3522	2479990E01	23.75nH
L3523	2462587N68	1000nH
L3531	2479990N01	43.67nH
L3532	2479990N01	43.67nH
L3538	2479990M01	30.54nH
L3551	2479990N01	43.67nH
L3552	2479990A02	7.66nH
L3701	2462587Q42	390nH
L3731	2462587Q20	2.2uH
L3801	2462587V34	100nH
L3809	2462587V27	27nH
L3811	2462587V34	100nH
L3812	2462587V34	100nH
L3813	2462587Q47	1uH
L3816	2462587V34	100nH
L3821	2462587N50	56nH
L3822	2462587N49	47nH
L3823	2462587N49	47nH
L3824	2462587N68	1000nH
L3825	2462587V34	100nH
L3826	2462587N68	1000nH
L3831	2462587N50	56nH
L3832	2462587N51	68nH
L3833	2462587N50	56nH
L3834	2462587N68	1000nH
L400	2462587Q42	390NH 10%
L401	2462587Q42	390NH 10%
L410	2462587Q42	390NH 10%
L411	2462587Q42	390NH 10%
L505	2462587Q42	390nH
PB501	4070354A01	Tact Switch
PB502	4070354A01	Tact Switch
PB504	4070354A01	Tact Switch
PB505	4070354A01	Tact Switch
Q3200	4813827A07	MMBR941
Q3201	4880214G02	NPN
Q3202	4880214G02	NPN
Q3270	4805218N63	BFQ67W
Q3301	4880214G02	NPN
Q3302	4813827A07	MMBR942
Q3501	4813828A09	RF Power FET

Circuit Ref	Motorola Part No.	Description
Q3561	4813824A17	PNP
Q3721	4802245J50	UMC5N
Q3801	4813827A07	MMBR943
Q400	4809579E18	MOSFET P-CHAN
Q403	4813824A17	TSTR MMBT3906
Q405	4802245J54	Dual NPN
Q410	4802245J54	Dual NPN
Q417	4802245J50	Dual NPN/PNP
Q502	5180159R01	Dual NPN
Q505	4880214G02	NPN
R3200	0662057M54	150
R3201	0662057M82	2.2K
R3202	0662057M90	4.7K
R3203	0662057M98	10K
R3204	0662057M26	10
R3205	0662057M74	1K
R3206	0662057N23	100K
R3207	0662057N13	39K
R3208	0662057M50	100
R3209	0662057M74	1K
R3210	0662057M82	2.2K
R3211	0662057M82	2.2K
R3212	0662057M90	4.7K
R3213	0662057M82	2.2K
R3214	0662057M34	22
R3219	0662057M50	100
R3220	0662057M90	4.7K
R3221	0662057M50	100
R3224	0662057M26	10
R3225	0662057M74	1K
R3226	0662057M26	10
R3270	0662057M74	1K
R3271	0662057M42	47
R3272	0662057N15	47K
R3273	0662057N15	47K
R3274	0662057M83	2.4K
R3275	0662057M74	1K
R3276	0662057N30	200K
R3303	0662057N23	100K
R3304	0662057N23	100K
R3305	0662057N19	68K
R3306	0662057M82	2.2K
R3307	0662057N11	33K
R3308	0662057M78	1.5K
R3309	0662057M92	5.6K
R3310	0662057M98	10K
R3311	0662057M26	10
R3312	0662057M38	33
R3313	0662057M34	22
R3314	0662057M26	10
R3315	0662057M62	330

Circuit Ref	Motorola Part No.	Description
R3316	0662057M66	470
R3317	0662057N23	100K
R3318	0662057M66	470
R3321	0662057M54	150
R3322	0662057M58	220
R3323	0662057M32	18
R3324	0662057M58	220
R3501	0662057M61	300
R3502	0662057M32	18
R3503	0662057M61	300
R3505	0662057M62	330
R3512	0662057A27	120
R3513	0662057A25	100
R3519	0680539Z01	0.1
R3542	0662057M92	5.6K
R3543	0662057M50	100
R3544	0662057A25	100
R3545	0662057A25	100
R3546	0662057N11	33K
R3547	0662057N01	12K
R3548	0662057M95	7.5K
R3551	0662057M40	39
R3561	0662057N01	12K
R3562	0662057N11	33K
R3563	0662057N33	270K
R3564	0662057N35	330K
R3569	0662057M92	5.6K
R3570	0662057M98	10K
R3571	0662057A27	120
R3572	0662057A27	120
R3573	0662057A27	120
R3701	0662057M50	100
R3703	0662057M54	150
R3704	0662057M54	150
R3705	0662057N11	33K
R3721	0662057M66	470
R3722	0662057M74	1K
R3723	0662057M50	100
R3727	0662057N23	100K
R3741	0662057M50	100
R3751	0662057N30	200K
R3752	0662057N35	330K
R3761	0662057N15	47K
R3802	0662057M50	100
R3803	0662057M58	220
R3804	0662057M98	10K
R3805	0662057N08	24K
R3806	0662057M34	22
R3808	0662057M26	10
R3811	0662057M50	100
R3816	0662057M74	1K

Circuit Ref	Motorola Part No.	Description
R3817	0662057M01	0
R3821	0662057M58	220
R3822	0662057M42	47
R3823	0662057N11	33K
R3824	0662057N07	22K
R3825	0662057M38	33
R3826	0662057M32	18
R3828	0662057M50	100
R3829	0662057M01	0
R3831	0662057M98	10K
R3832	0662057N01	12K
R3833	0662057M58	220
R3834	0662057M42	47
R3835	0662057N15	47K
R3836	0662057M98	10K
R400	0662057N15	47K
R406	0662057N20	75K
R409	0662057M98	10K
R410	0662057N23	100K
R411	0662057M98	10K
R413	0662057M01	0
R414	0662057V34	180K
R415	0662057V26	91K
R416	0662057N13	39K
R418	0662057M01	0
R421	0662057M81	2K
R423	0662057N39	470K
R424	0662057N12	36K
R425	0662057N10	30K
R427	0662057M84	2.7K
R428	0662057M10	2.2
R429	0662057M98	10K
R431	0662057N39	470K
R432	0662057N16	51K
R434	0662057M62	330
R435	0662057M81	2K
R436	0662057M01	0
R445	0662057N08	24K
R446	0662057N31	220K
R447	0662057N51	1.5MEG
R448	0662057N33	270K
R449	0662057N08	24K
R450	0683962T45	68,1 W
R451	0662057N03	15K 5%
R457	0662057M98	10K
R460	0662057M90	4.7K
R463	0662057M61	300
R471	0662057M92	5.6K
R472	0662057N12	36K
R473	0662057M26	10
R475	0662057M01	0

Circuit Ref	Motorola Part No.	Description
R476	0662057N08	24K
R477	0662057M74	1K
R478	0662057M98	10K
R481	0662057N08	24K
R492	0662057M01	0
R498	0662057M98	10K
R499	0662057M98	10K
R501	0662057M70	680
R502	0662057M56	180
R505	0662057M98	10K
R506	0662057N15	47K
R702	0662057M01	0
RT400	0680590Z01	Thermistor 33K
S501	4080710Z01	Channel Switch
	4080710Z02	**Frequency Switch
S502	1880619Z02	Volume Switch
SH3201	2602023X08	SHIELD
SH3202	2686081B02	SHIELD
SH3203	2686081B03	SHIELD
SH3301	2686081B01	SHIELD
SH3302	2686081B05	SHIELD
SH3303	2686081B06	SHIELD
SH3501	2686081B03	SHIELD
SH3502	2686081B04	SHIELD
SH3701	2680511Z01	SHIELD
SH3702	2680511Z01	SHIELD
SH3801	2680513Z01	SHIELD
SH3802	2680514Z01	SHIELD
SH400	2602001P16	Aoba Ctrl Shield
T3301	2580541Z02	XFMR Coil
T3302	2580541Z02	XFMR Coil
U3201	5102463J58	LP2980
U3220	5109632D83	LVZIF
U3501	5185130C65	LDMOS Driver
U3502	5185765B28	PCIC
U3503	5185963A15	Temperature Sense
U3701	5185963A27	LVFRACN
U3711	5105739X05	Regulator Linear
U3801	5105750U54	VCO IC
U3802	2113743L17	1000pF
U400	5102463J40	3.3V Reg
U404	5185130C53	Asfic Cmp
U406	5102463J59	Flash Rom 256K
U407	5102463J62	EEPROM 16Kx8
U409	5102226J56	uP HC11FLO
U420	5102463J44	Audio Pa
VR432	4805656W08	5.6V Zener
VR433	4805656W08	5.6V Zener
VR439	4880140L17	12V Zener
VR445	4880140L15	10V ZENER
VR446	4880140L15	10V ZENER

Circuit Ref	Motorola Part No.	Description
VR447	4880140L15	10V ZENER
VR448	4880140L15	10V ZENER
VR449	4880140L15	10V ZENER
VR450	4880140L15	10V ZENER
VR501	4813830A18	6.8V Zener
VR506	4802245J73	6.8 Zener
Y3200	9186153B01	XTAL
Y3761	4805875Z04	XTAL 16.8MHz

* Motorola Depot Servicing only

** For EX600 XLS models only

6.2 VHF Circuit Board/ Schematic Diagrams and Parts List (PCB No. 8471021L01)

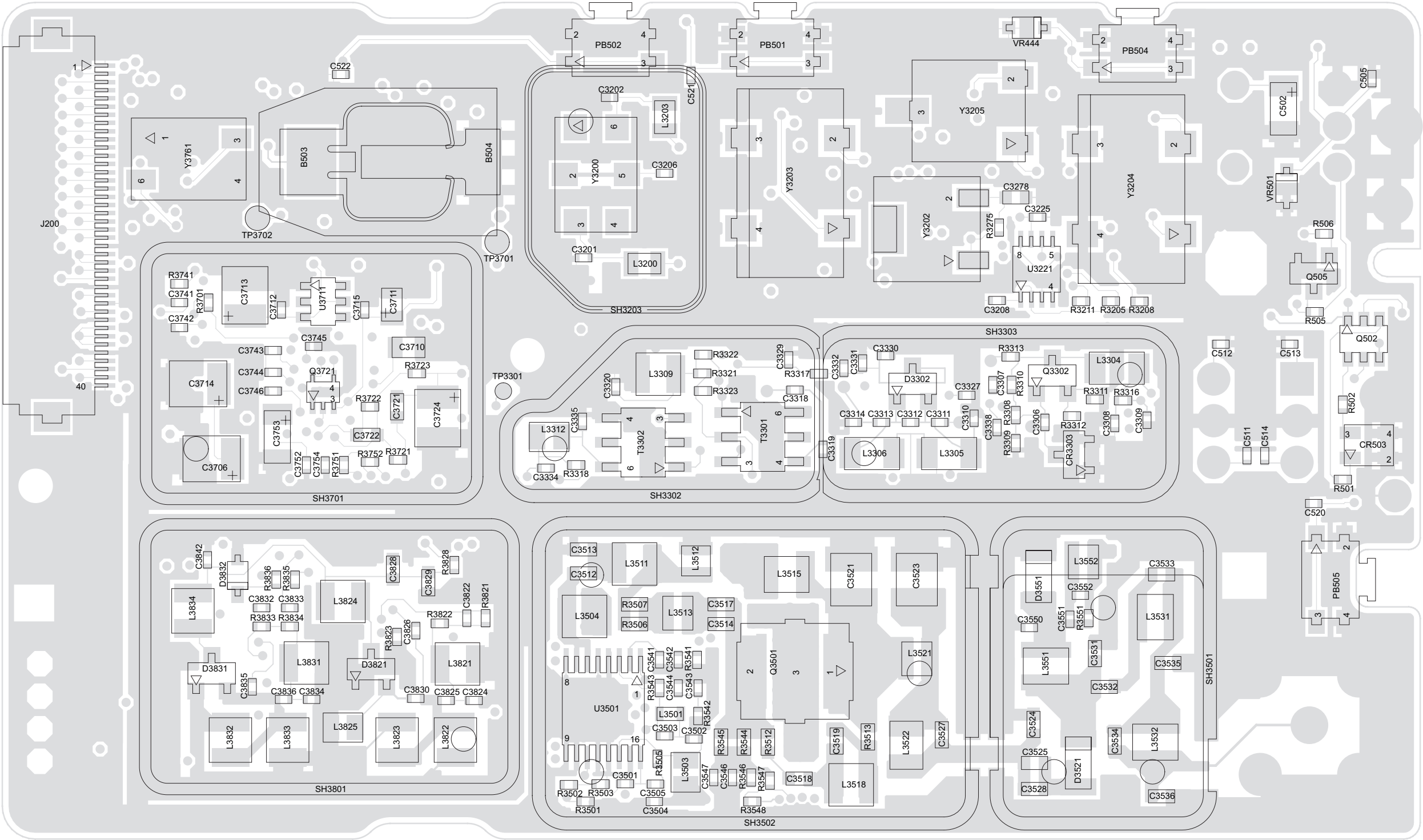


Figure 6-9: VHF (136-174MHz) Main Board Top Side PCB No. 8471021L01

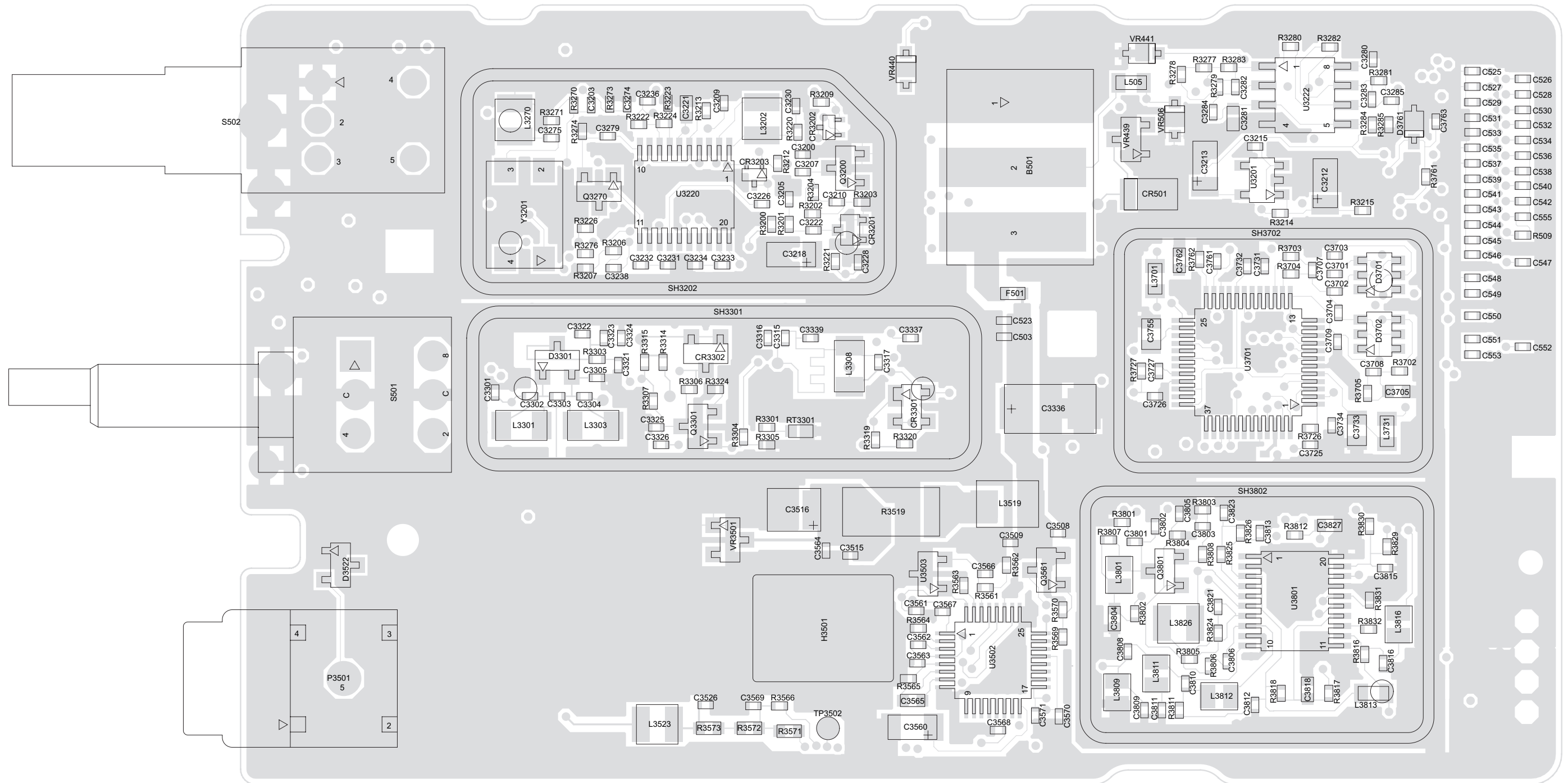


Figure 6-10: VHF (136-174MHz) Main Board Bottom Side PCB No. 8471021L01

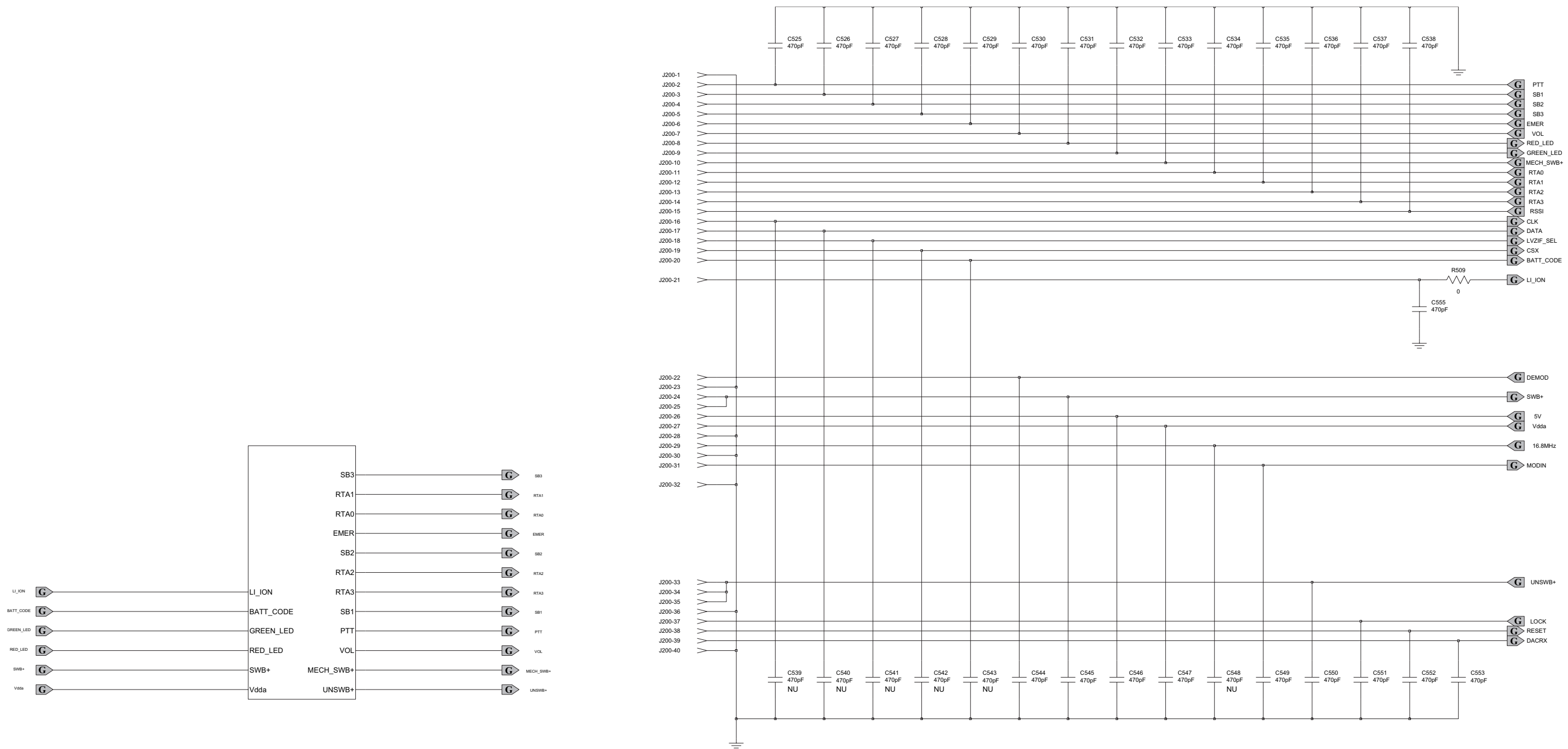


Figure 6-11: VHF Controls And Switches Schematic Diagram for PCB no. 8471021L01 (sheet 1 of 2)

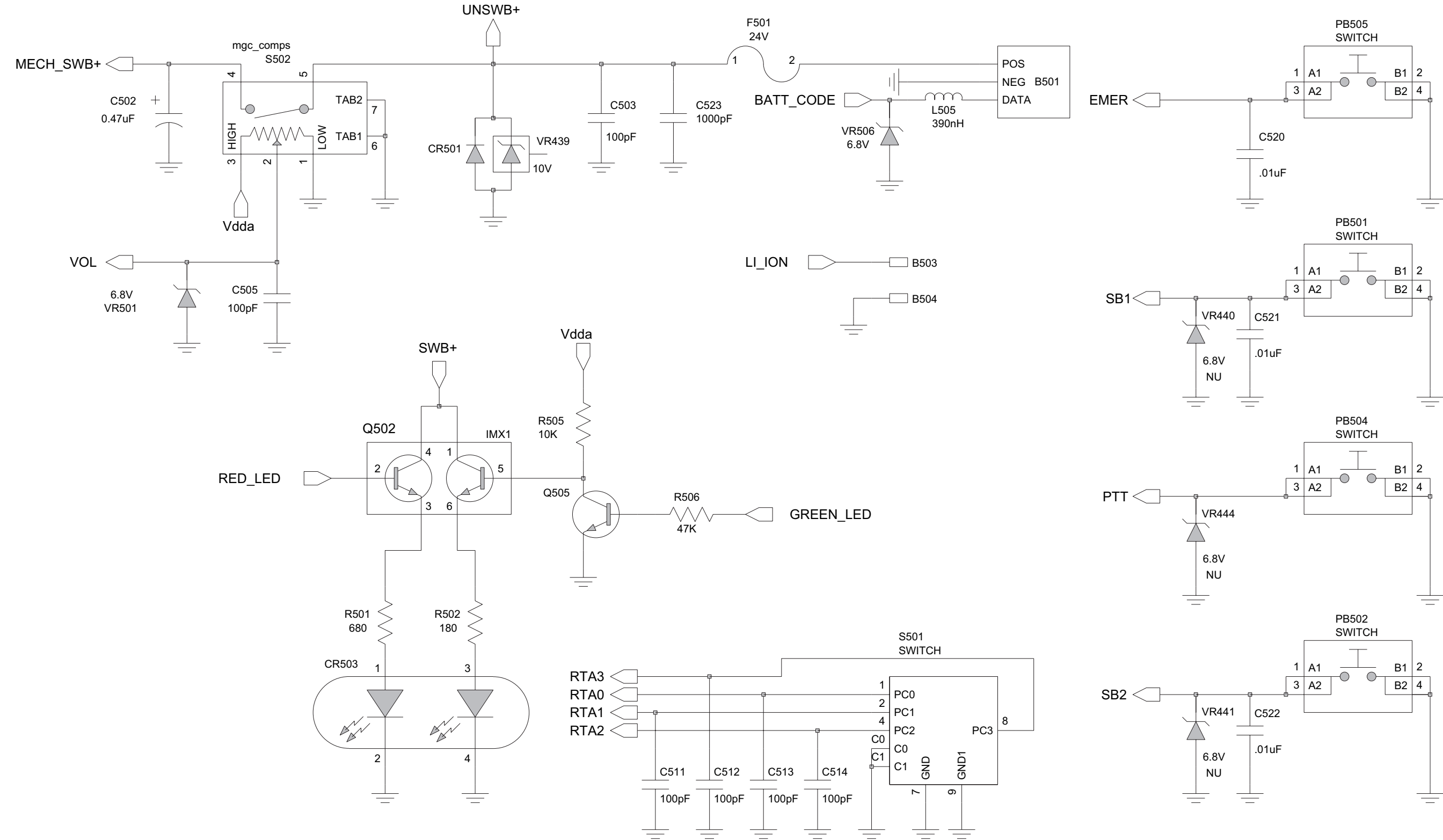


Figure 6-12: VHF Controls And Switches Schematic Diagram for PCB no. 8471021L01 (sheet 2 of 2)

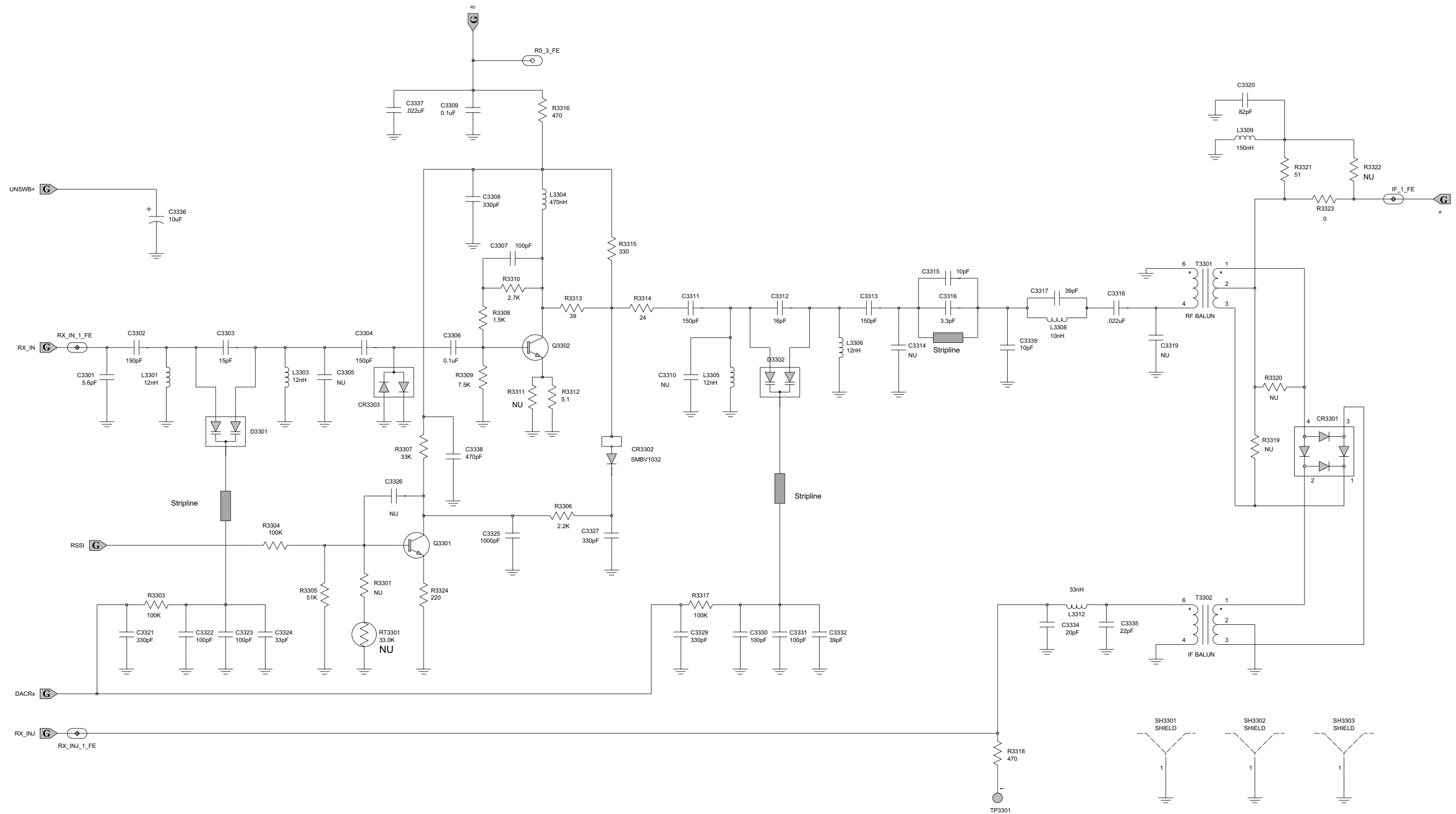


Figure 6-13: VHF Receiver Front End Schematic Diagram (for PCB no. 8471021L01)

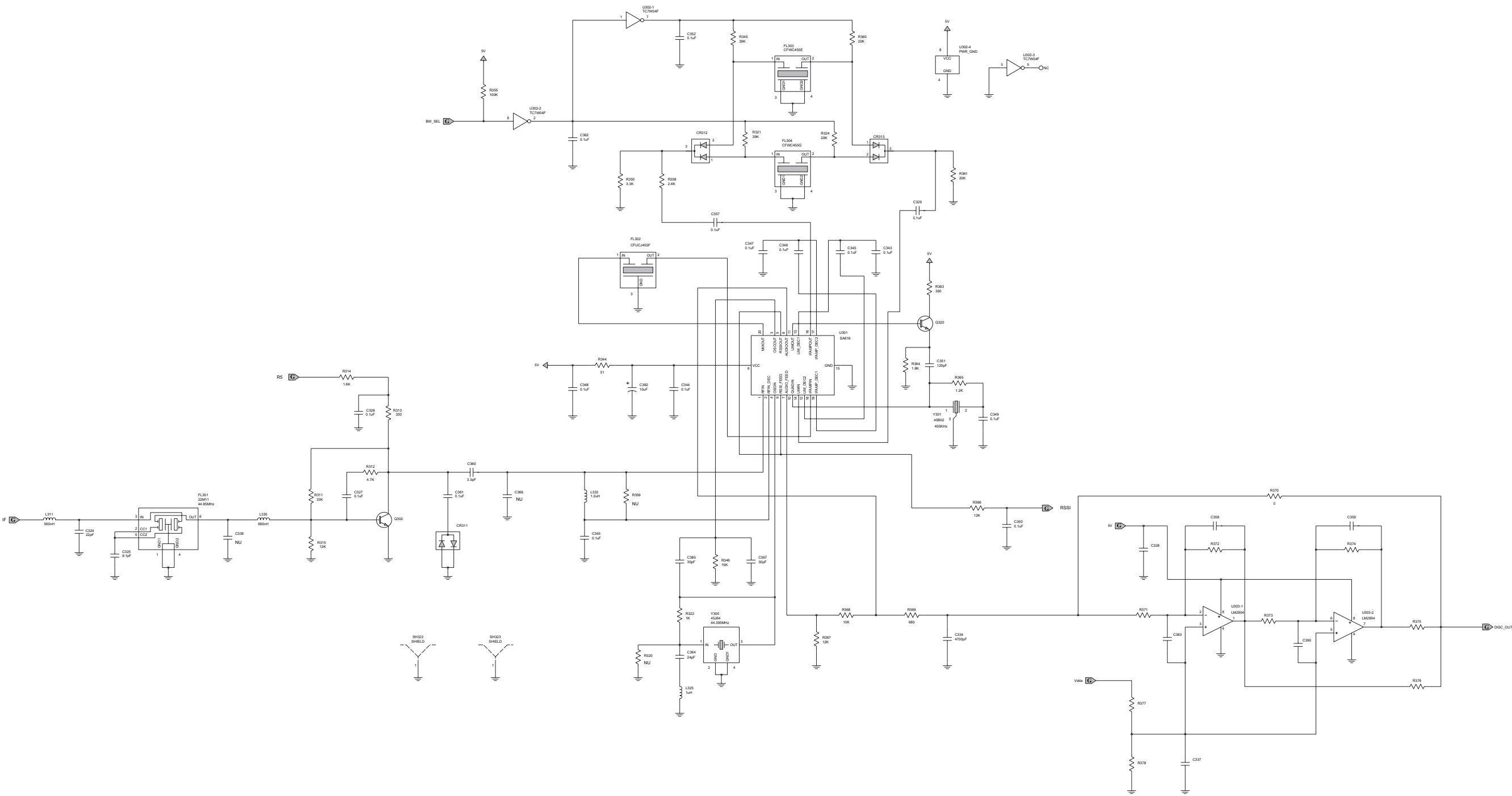


Figure 6-14: VHF Receiver Back End Schematic Diagram (for PCB no. 8471021L01)

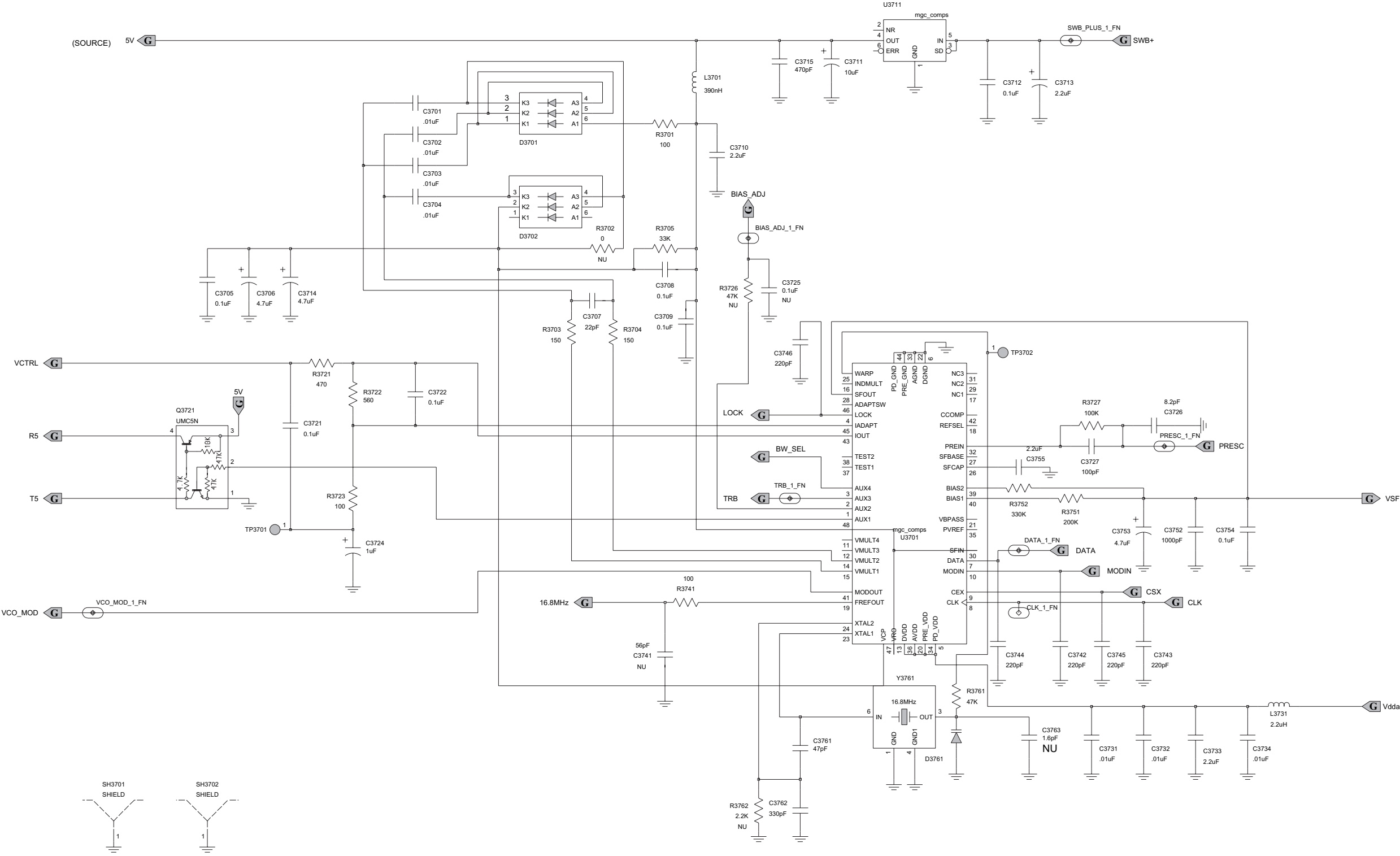


Figure 6-15: VHF Synthesizer Schematic Diagram (for PCB no. 8471021L01)



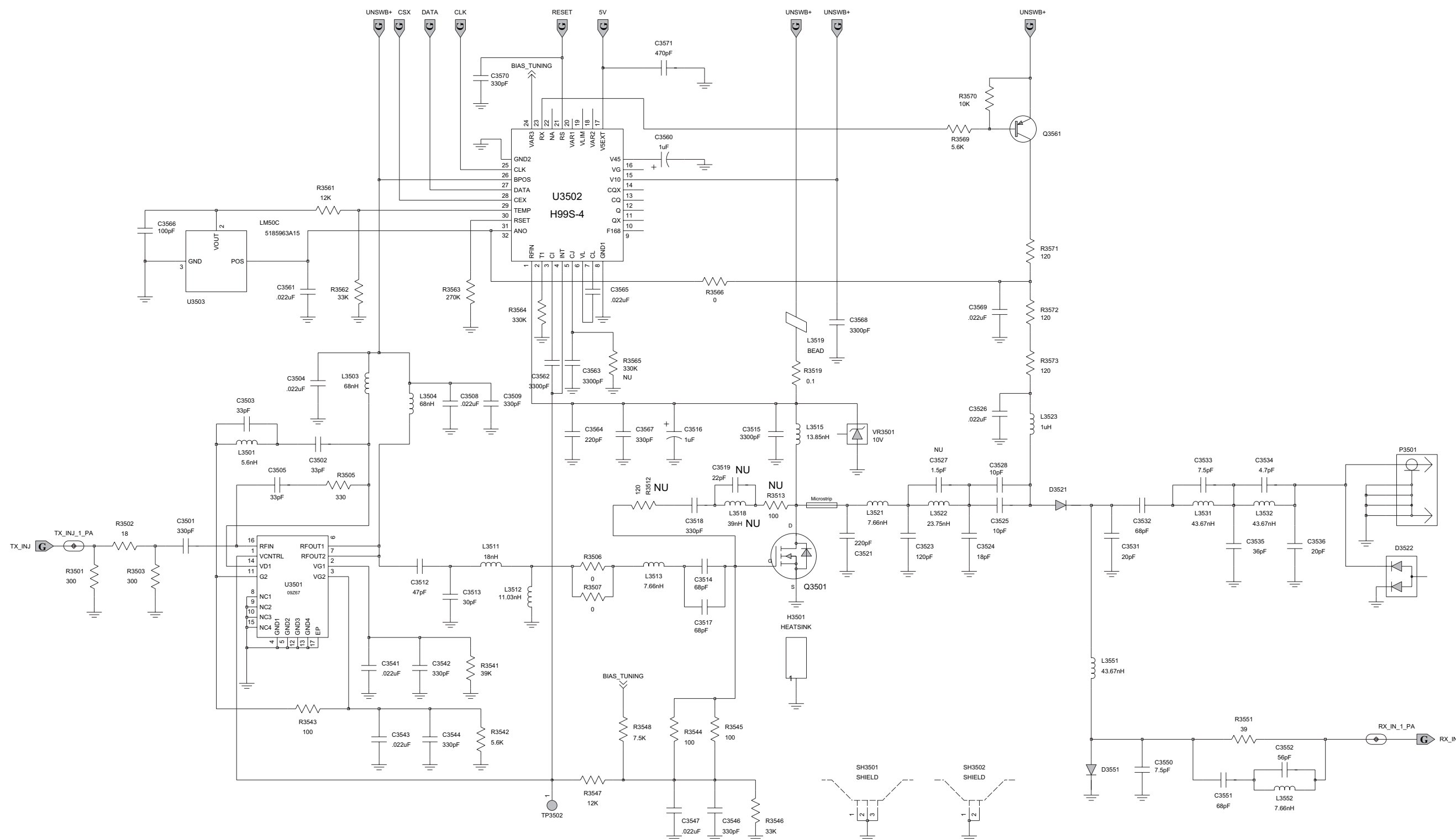


Figure 6-17: VHF Transmitter Schematic Diagram (for PCB no. 8471021L01)

Parts List for VHF (for PCB No. 8471021L01)

Circuit Ref	Motorola Part No.	Description
B501	8471021L01 0986237A02	PWB CONNECTOR (CONTACT BATTERY)
B503	3980502Z01	CONTACT, BACKUP B+
B504	3980501Z01	CONTACT, BACKUP B-
C3200	2113944A11	CAP CER CHP 2.7PF 50V +/- 0.25
C3201	2113944A79	CAP,FXD,16PF,+5%,-5%,50V-DC,04
C3202	NOTPLACED	GCAM DUMMY PART NUMBER
C3203	2113944A82	CAP,FXD,30PF,+5%,-5%,50V-DC,04
C3205	2113946K02	CAP CER CHP 0.10UF 16V
C3206	2115153H26	CAP, CERAMIC, COG
C3207	2113944A17	CAP CER CHP 4.7PF 50V +/- 0.25
C3208	2113946K02	CAP CER CHP 0.10UF 16V
C3209	2113946K02	CAP CER CHP 0.10UF 16V
C3210	2113946K02	CAP CER CHP 0.10UF 16V
C3212	2313960B01	CAP,FXD,1UF,+10%,-10%,16V-DC,S
C3213	2313960B30	CAP,FXD,4.7UF,+10%,-10%,10V-DC
C3215	2113944A25	CAP CER CHP 10.0PF 50V +/- 0.5
C3218	2313960B57	CAP,FXD,10UF,+10%,-10%,6.3V-DC
C3221	2113945D04	CAP CER CHP 100,000PF 25V 10%
C3222	2113946K02	CAP CER CHP 0.10UF 16V
C3225	2113946K02	CAP CER CHP 0.10UF 16V
C3226	2113946K02	CAP CER CHP 0.10UF 16V
C3228	2113946K02	CAP CER CHP 0.10UF 16V
C3230	2113946K02	CAP CER CHP 0.10UF 16V
C3231	2113946K02	CAP CER CHP 0.10UF 16V
C3232	2113946K02	CAP CER CHP 0.10UF 16V
C3233	2113946K02	CAP CER CHP 0.10UF 16V
C3234	2113946K02	CAP CER CHP 0.10UF 16V
C3236	2113945A13	CAP CER CHP 4700PF 50V 10%
C3238	2113946K02	CAP CER CHP 0.10UF 16V
C3274	2113944A82	CAP,FXD,30PF,+5%,-5%,50V-DC,04
C3275	2113944A81	CAP,FXD,24PF,+5%,-5%,50V-DC,04

Circuit Ref	Motorola Part No.	Description
C3278	2113945D04	CAP CER CHP 100,000PF 25V 10%
C3279	2113944A41	CAP CER CHP 120.0PF 50V 5%
C3280	2113946K02	CAP CER CHP 0.10UF 16V
C3281	2113946D02	CAP CER CHP 1.0UF 6.3V 10%
C3282	2113944A21	CAP CER CHP 6.8PF 50V +/- 0.5P
C3283	NOTPLACED	GCAM DUMMY PART NUMBER
C3284	2113944A85	CAP,FXD,51PF,+5%,-5%,50V-DC,04
C3285	NOTPLACED	GCAM DUMMY PART NUMBER
C3301	2113944A19	CAP CER CHP 5.6PF 50V +/- 0.5P
C3302	2113944A42	CAP CER CHP 150.0PF 50V 5%
C3303	2113944A27	CAP CER CHP 15.0PF 50V 5%
C3304	2113944A42	CAP CER CHP 150.0PF 50V 5%
C3305	NOTPLACED	GCAM DUMMY PART NUMBER
C3306	2113946B04	CAP CER CHP 0.10UF 10V 10%
C3307	2113944A40	CAP CER CHP 100.0PF 50V 5%
C3308	2113945A03	CAP CER CHP 330PF 50V 10%
C3309	2113946B04	CAP CER CHP 0.10UF 10V 10%
C3310	NOTPLACED	GCAM DUMMY PART NUMBER
C3311	2113944A42	CAP CER CHP 150.0PF 50V 5%
C3312	2113944A79	CAP,FXD,16PF,+5%,-5%,50V-DC,04
C3313	2113944A42	CAP CER CHP 150.0PF 50V 5%
C3314	NOTPLACED	GCAM DUMMY PART NUMBER
C3315	2113944A25	CAP CER CHP 10.0PF 50V +/- 0.5
C3316	2113944A13	CAP CER CHP 3.3PF 50V +/- 0.25
C3317	2113944A82	CAP,FXD,30PF,+5%,-5%,50V-DC,04
C3318	2113945B04	CAP,FXD,.022UF,+10%,-10%,25V-D

Circuit Ref	Motorola Part No.	Description
C3319	NOTPLACED	GCAM DUMMY PART NUMBER
C3320	2113944A38	CAP CER CHP 82.0PF 50V 5%
C3321	2113945A03	CAP CER CHP 330PF 50V 10%
C3322	2113944A40	CAP CER CHP 100.0PF 50V 5%
C3323	2113944A40	CAP CER CHP 100.0PF 50V 5%
C3324	2113944A31	CAP CER CHP 33.0PF 50V 5%
C3325	2113945A09	CAP CER CHP 1000PF 50V 10%
C3326	NOTPLACED	GCAM DUMMY PART NUMBER
C3327	2113945A03	CAP CER CHP 330PF 50V 10%
C3329	2113945A03	CAP CER CHP 330PF 50V 10%
C3330	2113944A40	CAP CER CHP 100.0PF 50V 5%
C3331	2113944A40	CAP CER CHP 100.0PF 50V 5%
C3332	2113944A32	CAP CER CHP 39.0PF 50V 5%
C3334	2113944A80	CAP,FXD,20PF,+5%,-5%,50V-DC,04
C3335	2113944A29	CAP CER CHP 22.0PF 50V 5%
C3336	2313960F04	CAP TANT 33 UF 10% 16V 6032-28
C3337	2113945B04	CAP,FXD,.022UF,+10%,-10%,25V-D
C3338	2113945A05	CAP CER CHP 470PF 50V 10%
C3339	2113944A25	CAP CER CHP 10.0PF 50V +/- 0.5
C3501	2113945A03	CAP CER CHP 330PF 50V 10%
C3502	2113944A31	CAP CER CHP 33.0PF 50V 5%
C3503	2113944A31	CAP CER CHP 33.0PF 50V 5%
C3504	2113945B04	CAP,FXD,.022UF,+10%,-10%,25V-D
C3505	2113944A31	CAP CER CHP 33.0PF 50V 5%
C3508	2113945B04	CAP,FXD,.022UF,+10%,-10%,25V-D

Circuit Ref	Motorola Part No.	Description
C3509	2113945A03	CAP CER CHP 330PF 50V 10%
C3512	2113944C38	CAP CER CHP 56.0PF 50V 5%CAP C
C3513	2113944C82	CAP,FXD,30PF,+5%,-5%,50V-DC,06
C3514	2113944C41	CAP CER CHP 68.0PF 50V 5%
C3515	2113945A12	CAP CER CHP 3300PF 50V 10%
C3516	2313960C26	CAP,FXD,1UF,+10%,-10%,35V-DC,S
C3517	2113944C41	CAP CER CHP 68.0PF 50V 5%
C3518	NOTPLACED	GCAM DUMMY PART NUMBER
C3519	NOTPLACED	GCAM DUMMY PART NUMBER
C3521	2111078B51	CAP CHIP RF 220 5 NPO 100V
C3523	2111078B44	CAP CHIP RF 120 5 NPO 100V
C3524	2113944C80	CAP,FXD,20PF,+5%,-5%,50V-DC,06
C3525	2113944C30	CAP CER CHP 10.0PF 50V +/- 0.5
C3526	2113945B04	CAP,FXD,.022UF,+10%,-10%,25V-D
C3527	NOTPLACED	GCAM DUMMY PART NUMBER
C3528	2113944C30	CAP CER CHP 10.0PF 50V +/- 0.5
C3531	2113944C80	CAP,FXD,20PF,+5%,-5%,50V-DC,06
C3532	2113944C41	CAP CER CHP 68.0PF 50V 5%
C3533	2113944C27	CAP CER CHP 7.5PF 50V +/- 0.5P
C3534	2113944C22	CAP CER CHP 4.7PF 50V +/- 0.25
C3535	2113944C35	CAP CER CHP 27.0PF 50V 5%
C3536	2113944C32	CAP CER CHP 15.0PF 50V 5%
C3541	2113945B04	CAP,FXD,.022UF,+10%,-10%,25V-D
C3542	2113945A03	CAP CER CHP 330PF 50V 10%
C3543	2113945B04	CAP,FXD,.022UF,+10%,-10%,25V-D

Circuit Ref	Motorola Part No.	Description	Circuit Ref	Motorola Part No.	Description	Circuit Ref	Motorola Part No.	Description	Circuit Ref	Motorola Part No.	Description
C3544	2113945A03	CAP CER CHP 330PF 50V 10%	C3708	2113946B04	CAP CER CHP 0.10UF 10V 10%	C3754	2113946B04	CAP CER CHP 0.10UF 10V 10%	C3827	2113945C04	CAP CER CHP 22,000PF 50V 10%
C3546	2113945A03	CAP CER CHP 330PF 50V 10%	C3709	2113946B04	CAP CER CHP 0.10UF 10V 10%	C3755	2113946N03	CAP CER CHP 2.2UF 16V	C3828	2185895Z01	CAPACITOR CER LOW DIST .01UF
C3547	2113945B04	CAP,FXD,.022UF,+10%,-10%,25V-D	C3710	2113946N03	CAP CER CHP 2.2UF 16V	C3761	2113944A33	CAP CER CHP 47.0PF 50V 5%	C3829	2185895Z01	CAPACITOR CER LOW DIST .01UF
C3550	2113944A22	CAP CER CHP 7.5PF 50V +/-0.5P	C3711	2313960M51	CAP,FXD,10UF,+10%,-10%,6.3V-DC	C3762	2113944C04	CAP CER CHP 330.0PF 50V 5%	C3830	2113944A36	CAP CER CHP 68.0PF 50V 5%
C3551	2113944A36	CAP CER CHP 68.0PF 50V 5%	C3712	2113946B04	CAP CER CHP 0.10UF 10V 10%	C3763	NOTPLACED	GCAM DUMMY PART NUMBER	C3832	2113945A09	CAP CER CHP 1000PF 50V 10%
C3552	2113944A34	CAP CER CHP 56.0PF 50V 5%	C3713	2313960C78	CAP,FXD,2.2UF,+10%,-10%,20V-DC	C3801	2113944A17	CAP CER CHP 4.7PF 50V +/-0.25	C3833	2113944A17	CAP CER CHP 4.7PF 50V +/-0.25
C3560	2313960B01	CAP,FXD,1UF,+10%,-10%,16V-DC,S	C3714	2313960D05	CAP,FXD,4.7UF,+10%,-10%,16V-DC	C3802	NOTPLACED	GCAM DUMMY PART NUMBER	C3834	2113944A34	CAP CER CHP 56.0PF 50V 5%
C3561	2113945B04	CAP,FXD,.022UF,+10%,-10%,25V-D	C3715	2113945A05	CAP CER CHP 470PF 50V 10%	C3803	2113945A09	CAP CER CHP 1000PF 50V 10%	C3835	2113944A21	CAP CER CHP 6.8PF 50V +/-0.5P
C3562	2113945A12	CAP CER CHP 3300PF 50V 10%	C3721	2113945D04	CAP CER CHP 100,000PF 25V 10%	C3804	2113945D04	CAP CER CHP 100,000PF 25V 10%	C3836	2113944A27	CAP CER CHP 15.0PF 50V 5%
C3563	2113945A12	CAP CER CHP 3300PF 50V 10%	C3722	2113945D04	CAP CER CHP 100,000PF 25V 10%	C3805	2113944A17	CAP CER CHP 4.7PF 50V +/-0.25	C3842	2113945A09	CAP CER CHP 1000PF 50V 10%
C3564	2113945A01	CAP CER CHP 220PF 50V 10,	C3724	2313960C26	CAP,FXD,1UF,+10%,-10%,35V-DC,S	C3806	2113944A40	CAP CER CHP 100.0PF 50V 5%	C502	2313960A55	CAP,FXD,.47UF,+10%,-10%,25V-DC
C3565	2113945C04	CAP CER CHP 22,000PF 50V 10%	C3725	NOTPLACED	GCAM DUMMY PART NUMBER	C3808	2113944A27	CAP CER CHP 15.0PF 50V 5%	C503	2113944A40	CAP CER CHP 100.0PF 50V 5%
C3566	2113944A40	CAP CER CHP 100.0PF 50V 5%	C3726	2113944A23	CAP CER CHP 8.2PF 50V +/-0.5P	C3809	2113944A35	CAP CER CHP 62.0PF 50V 5%	C505	2113944A40	CAP CER CHP 100.0PF 50V 5%
C3567	2113945A03	CAP CER CHP 330PF 50V 10%	C3727	2113944A40	CAP CER CHP 100.0PF 50V 5%	C3810	NOTPLACED	GCAM DUMMY PART NUMBER	C511	2113944A40	CAP CER CHP 100.0PF 50V 5%
C3568	2113945A12	CAP CER CHP 3300PF 50V 10%	C3731	2113945B02	CAP CER CHP 10,000PF 25V 10%	C3811	2113946B04	CAP CER CHP 0.10UF 10V 10%	C512	2113944A40	CAP CER CHP 100.0PF 50V 5%
C3569	2113945B04	CAP,FXD,.022UF,+10%,-10%,25V-D	C3732	2113945B02	CAP CER CHP 10,000PF 25V 10%	C3812	2113946B04	CAP CER CHP 0.10UF 10V 10%	C513	2113944A40	CAP CER CHP 100.0PF 50V 5%
C3570	2113945A03	CAP CER CHP 330PF 50V 10%	C3733	2113946N03	CAP CER CHP 2.2UF 16V	C3813	2113945B02	CAP CER CHP 10,000PF 25V 10%	C514	2113944A40	CAP CER CHP 100.0PF 50V 5%
C3571	2113945A05	CAP CER CHP 470PF 50V 10%	C3734	2113945B02	CAP CER CHP 10,000PF 25V 10%	C3815	2113945A09	CAP CER CHP 1000PF 50V 10%	C520	2113945B02	CAP CER CHP 10,000PF 25V 10%
C3701	2113945B02	CAP CER CHP 10,000PF 25V 10%	C3741	NOTPLACED	GCAM DUMMY PART NUMBER	C3816	2113944A21	CAP CER CHP 6.8PF 50V +/-0.5P	C521	2113945B02	CAP CER CHP 10,000PF 25V 10%
C3702	2113945B02	CAP CER CHP 10,000PF 25V 10%	C3742	2113945A01	CAP CER CHP 220PF 50V 10,	C3818	2113945C04	CAP CER CHP 22,000PF 50V 10%	C522	2113945B02	CAP CER CHP 10,000PF 25V 10%
C3703	2113945B02	CAP CER CHP 10,000PF 25V 10%	C3743	2113945A01	CAP CER CHP 220PF 50V 10,	C3821	2113945B02	CAP CER CHP 10,000PF 25V 10%	C523	2113945A09	CAP CER CHP 1000PF 50V 10%
C3704	2113945B02	CAP CER CHP 10,000PF 25V 10%	C3744	2113945A01	CAP CER CHP 220PF 50V 10,	C3822	2113945A09	CAP CER CHP 1000PF 50V 10%	C525	2113945A05	CAP CER CHP 470PF 50V 10%
C3705	2113945D04	CAP CER CHP 100,000PF 25V 10%	C3745	2113945A01	CAP CER CHP 220PF 50V 10,	C3823	2113945B02	CAP CER CHP 10,000PF 25V 10%	C526	2113945A05	CAP CER CHP 470PF 50V 10%
C3706	2313960D05	CAP,FXD,4.7UF,+10%,-10%,16V-DC	C3746	2113945A01	CAP CER CHP 220PF 50V 10,	C3824	2113944A34	CAP CER CHP 56.0PF 50V 5%	C527	2113945A05	CAP CER CHP 470PF 50V 10%
C3707	2113944A29	CAP CER CHP 22.0PF 50V 5%	C3752	2113945A09	CAP CER CHP 1000PF 50V 10%	C3825	2113944A27	CAP CER CHP 15.0PF 50V 5%	C528	2113945A05	CAP CER CHP 470PF 50V 10%
			C3753	2313960B30	CAP,FXD,4.7UF,+10%,-10%,10V-DC	C3826	2113944A17	CAP CER CHP 4.7PF 50V +/-0.25			

Circuit Ref	Motorola Part No.	Description
C529	2113945A05	CAP CER CHP 470PF 50V 10%
C530	2113945A05	CAP CER CHP 470PF 50V 10%
C531	2113945A05	CAP CER CHP 470PF 50V 10%
C532	2113945A05	CAP CER CHP 470PF 50V 10%
C533	2113945A05	CAP CER CHP 470PF 50V 10%
C534	2113945A05	CAP CER CHP 470PF 50V 10%
C535	2113945A05	CAP CER CHP 470PF 50V 10%
C536	2113945A05	CAP CER CHP 470PF 50V 10%
C537	2113945A05	CAP CER CHP 470PF 50V 10%
C538	2113945A05	CAP CER CHP 470PF 50V 10%
C539	NOTPLACED	GCAM DUMMY PART NUMBER
C540	NOTPLACED	GCAM DUMMY PART NUMBER
C541	NOTPLACED	GCAM DUMMY PART NUMBER
C542	NOTPLACED	GCAM DUMMY PART NUMBER
C543	NOTPLACED	GCAM DUMMY PART NUMBER
C544	2113945A05	CAP CER CHP 470PF 50V 10%
C545	2113945A05	CAP CER CHP 470PF 50V 10%
C546	2113945A05	CAP CER CHP 470PF 50V 10%
C547	2113945A05	CAP CER CHP 470PF 50V 10%
C548	NOTPLACED	GCAM DUMMY PART NUMBER
C549	2113945A05	CAP CER CHP 470PF 50V 10%
C550	2113945A05	CAP CER CHP 470PF 50V 10%
C551	2113945A05	CAP CER CHP 470PF 50V 10%
C552	2113945A05	CAP CER CHP 470PF 50V 10%
C553	2113945A05	CAP CER CHP 470PF 50V 10%

Circuit Ref	Motorola Part No.	Description
C555	2113945A05	CAP CER CHP 470PF 50V 10%
CR3201	4813974A19	DIODE ARRAY,MXR,SM,SOT-323,7V,
CR3202	4815047H01	DIODE,SWG,DAN235EFTL,3 5V
CR3203	4815047H01	DIODE,SWG,DAN235EFTL,3 5V
CR3301	4815923H02	SCHOTTKY DIODE-NEW LEADFREE
CR3302	4815129H01	DIODE DUAL BONDS RH
CR3303	4815048H01	SOT MMBD353 DIODE DUAL SHT
CR501	4815155H01	RECTIFIER
CR503	4805729G49	DIODE RED/YEL
D3301	4815276H01	VARACTOR DIODE FROM INFINEON
D3302	4815276H01	VARACTOR DIODE FROM INFINEON
D3521	4880973Z02	PIN DIODE
D3522	4813978C06	DIODE ARRAY,SIGNL/ SWG,SOT-23
D3551	4880973Z02	PIN DIODE
D3701	4815011H01	DIODE TRIPLE
D3702	4815011H01	DIODE TRIPLE
D3761	4815072H01	DIODE VARACTOR
D3821	4885094Y01	DIODE VARACTOR ISV228 W18
D3831	4885094Y01	DIODE VARACTOR ISV228 W18
D3832	4885055Y01	DIODE VARACTOR PB-FREE
F501	6515076H01	FUSE CHIP SMT TR/1608FF 3A
H3501	2680499Z02	HEAT SPREADER
J200	0915064H03	CONNECTOR, ZIF (40 PINS)
L3200	2414017K33	IDCTR,CHIP,680NH,5%,50M A,5.5OH
L3202	2414015A25	IDCTR,CHIP,1.2UH,2%,440M A,2OHM
L3203	2414017K33	IDCTR,CHIP,680NH,5%,50M A,5.5OH
L3270	2414032B68	IDCTR,WW,1UH,5%,460MA,1 .75OHM,
L3301	2414032D35	IDCTR,WW,12NH,5%,1A,.08 OHM,CER
L3303	2414032D35	IDCTR,WW,12NH,5%,1A,.08 OHM,CER
L3304	2414032D23	IDCTR,WW,470NH,5%,490M A,1.3OHM

Circuit Ref	Motorola Part No.	Description
L3305	2414032D35	IDCTR,WW,12NH,5%,1A,.08 OHM,CER
L3306	2414032D35	IDCTR,WW,12NH,5%,1A,.08 OHM,CER
L3308	2414032D34	IDCTR,WW,10NH,5%,1A,.08 OHM,CER
L3309	2414032B55	IDCTR,WW,150NH,5%,800M A,.7OHM,
L3312	2414032F28	IDCTR,WW,33NH,5%,500MA, .27OHM,
L3501	2414017N09	IDCTR,CHIP,5.6NH,600MA,.2 OHM,C
L3503	2414032F32	IDCTR,WW,68NH,5%,500MA, .38OHM,
L3504	2414032B51	IDCTR,WW,68NH,5%,1A,.2O HM,CER,
L3511	2414032B44	IDCTR,WW,18NH,5%,1A,.11 OHM,CER
L3512	2479990B01	AIR WOUND COIL/GREEN COLOR 11.
L3513	2479990A02	AIR WND COIL/GREEN COLOR7.66NH
L3515	2479990C03	AIR WOUND COIL/GREEN COLOR 13.
L3518	NOTPLACED	GCAM DUMMY PART NUMBER
L3519	2415954H01	INDUCTOR BEAD CHIP
L3521	2479990A02	AIR WND COIL/GREEN COLOR7.66NH
L3522	2479990E01	COIL AIR WOUND/GREEN CLR 23.75
L3523	2414032B68	IDCTR,WW,1UH,5%,460MA,1 .75OHM,
L3531	2479990N01	AIR WND COIL/GREEN COLOR 43.67
L3532	2479990N01	AIR WND COIL/GREEN COLOR 43.67
L3551	2479990N01	AIR WND COIL/GREEN COLOR 43.67
L3552	2479990A02	AIR WND COIL/GREEN COLOR7.66NH
L3701	2414017Q42	IDCTR,FXD,390NH,10%,200 MA,.65O
L3731	2414017Q20	IDCTR,FXD,2.2UH,20%,30M A,.65OH
L3801	2414032F34	IDCTR,WW,100NH,5%,400M A,.46OHM
L3809	2414032F27	IDCTR,FXD,27NH,5%,500MA ,.25OHM
L3811	2414032F34	IDCTR,WW,100NH,5%,400M A,.46OHM

Circuit Ref	Motorola Part No.	Description
L3812	2414032F34	IDCTR,WW,100NH,5%,400M A,.46OHM
L3813	2414017Q47	IDCTR,FXD,1UH,10%,50MA,.45OHM,
L3816	2414032F34	IDCTR,WW,100NH,5%,400M A,.46OHM
L3821	2414032B50	IDCTR,WW,56NH,5%,1A,.18 OHM,CER
L3822	2414032B49	IDCTR,WW,47NH,5%,1A,.16 OHM,CER
L3823	2414032B49	IDCTR,WW,47NH,5%,1A,.16 OHM,CER
L3824	2414032B68	IDCTR,WW,1UH,5%,460MA,1 .75OHM,
L3825	2414032F34	IDCTR,WW,100NH,5%,400M A,.46OHM
L3826	2414032B68	IDCTR,WW,1UH,5%,460MA,1 .75OHM,
L3831	2414032B50	IDCTR,WW,56NH,5%,1A,.18 OHM,CER
L3832	2414032B51	IDCTR,WW,68NH,5%,1A,.2O HM,CER,
L3833	2414032B50	IDCTR,WW,56NH,5%,1A,.18 OHM,CER
L3834	2414032B68	IDCTR,WW,1UH,5%,460MA,1 .75OHM,
L505	2414017Q42	IDCTR,FXD,390NH,10%,200 MA,.65O
P3501	2880658Z08	SMA CONNECTOR
PB501	4070354A01	LIGHT TOUCH SWITCH-SMD
PB502	4070354A01	LIGHT TOUCH SWITCH-SMD
PB504	4070354A01	LIGHT TOUCH SWITCH-SMD
PB505	4070354A01	LIGHT TOUCH SWITCH-SMD
Q3200	4802197J95	RF TRANSISTOR PBR941
Q3270	4813973M07	XSTR,BIP GP SS,NPN,TO-236,
Q3301	4813973M07	XSTR,BIP GP SS,NPN,TO-236,
Q3302	4802197J95	RF TRANSISTOR PBR941
Q3501	4813976A01	175MHZ 8W 7.5V PLD-1.5 T&R
Q3561	4813973A13	XSTR,BIP GP SS,PNP,TO-236,SO
Q3721	4815055H01	TSTR DUAL NPN/PNP UMH 5
Q3801	4802197J95	RF TRANSISTOR PBR941
Q502	4815154H01	DUAL TRANS NPN

Circuit Ref	Motorola Part No.	Description	Circuit Ref	Motorola Part No.	Description	Circuit Ref	Motorola Part No.	Description	Circuit Ref	Motorola Part No.	Description
Q505	4813973M07	XSTR,BIP GP SS,NPN,TO-236,	R3274	0613952Q79	CER CHIP RES 1800 OHM 5 0402	R3315	0613952Q61	CER CHIP RES 330 OHM 5 0402	R3547	0613952R13	CER CHIP RES 33K OHM 5% 0402
R3200	0613952Q71	CER CHIP RES 820 OHM 5 0402	R3275	0613952Q75	CER CHIP RES 1200 OHM 5 0402	R3316	0613952Q65	CER CHIP RES 470 OHM 5 0402	R3548	0613952R09	CER CHIP RES 22K OHM 5% 0402
R3201	0613952Q68	CER CHIP RES 620 OHM 5 0402	R3276	0613952R25	CER CHIP RES 100K OHM 5% 0402	R3317	0613952R25	CER CHIP RES 100K OHM 5% 0402	R3551	0613952Q39	CER CHIP RES 39.0 OHM 5 0402
R3202	0613952R11	CER CHIP RES 27K OHM 5% 0402	R3277	NOTPLACED	GCAM DUMMY PART NUMBER	R3318	0613952Q65	CER CHIP RES 470 OHM 5 0402	R3561	0613952R03	CER CHIP RES 12K OHM 5% 0402
R3203	0613952R03	CER CHIP RES 12K OHM 5% 0402	R3278	0613952R25	CER CHIP RES 100K OHM 5% 0402	R3319	NOTPLACED	GCAM DUMMY PART NUMBER	R3562	0613952R13	CER CHIP RES 33K OHM 5% 0402
R3204	0613952Q89	CER CHIP RES 4700 OHM 5 0402	R3279	0613952R30	CER CHIP RES 160K OHM 5 0402	R3320	NOTPLACED	GCAM DUMMY PART NUMBER	R3563	0613952R35	CER CHIP RES 270K OHM 5% 0402
R3205	0613952R08	CER CHIP RES 20K OHM 5 0402	R3280	NOTPLACED	GCAM DUMMY PART NUMBER	R3321	0613952Q42	CER CHIP RES 51.0 OHM 5 0402	R3564	0613952R37	CER CHIP RES 330K OHM 5% 0402
R3206	0613952Q72	CER CHIP RES 910 OHM 5 0402	R3281	NOTPLACED	GCAM DUMMY PART NUMBER	R3322	NOTPLACED	GCAM DUMMY PART NUMBER	R3565	NOTPLACED	GCAM DUMMY PART NUMBER
R3207	0613952R03	CER CHIP RES 12K OHM 5% 0402	R3282	NOTPLACED	GCAM DUMMY PART NUMBER	R3323	0613952R66	CER CHIP RES 0.0 +/-0.050 OHM	R3566	NOTPLACED	GCAM DUMMY PART NUMBER
R3208	0613952R08	CER CHIP RES 20K OHM 5 0402	R3283	0613952R66	CER CHIP RES 0.0 +/-0.050 OHM	R3324	0613952Q57	CER CHIP RES 220 OHM 5 0402	R3569	0613952Q91	CER CHIP RES 5600 OHM 5 0402
R3209	0613952R15	CER CHIP RES 39K OHM 5% 0402	R3284	0613952R25	CER CHIP RES 100K OHM 5% 0402	R3501	0613952Q60	CER CHIP RES 300 OHM 5 0402	R3570	0613952R01	CER CHIP RES 10K OHM 5% 0402
R3211	0613952R15	CER CHIP RES 39K OHM 5% 0402	R3285	0613952R25	CER CHIP RES 100K OHM 5% 0402	R3502	0613952Q31	CER CHIP RES 18.0 OHM 5 0402	R3571	0613952H51	CER CHIP RES 120 OHM 5% 0603
R3212	0613952R08	CER CHIP RES 20K OHM 5 0402	R3301	NOTPLACED	GCAM DUMMY PART NUMBER	R3503	0613952Q60	CER CHIP RES 300 OHM 5 0402	R3572	0613952H51	CER CHIP RES 120 OHM 5% 0603
R3213	0613952R03	CER CHIP RES 12K OHM 5% 0402	R3303	0613952R25	CER CHIP RES 100K OHM 5% 0402	R3505	0613952Q61	CER CHIP RES 330 OHM 5 0402	R3573	0613952H51	CER CHIP RES 120 OHM 5% 0603
R3214	0613952Q33	CER CHIP RES 22.0 OHM 5 0402	R3304	0613952R25	CER CHIP RES 100K OHM 5% 0402	R3506	0613952H15	CER CHIP RES 3.9 OHM 5 0603	R3701	0613952Q49	CER CHIP RES 100 OHM 5 0402
R3215	0613952R66	CER CHIP RES 0.0 +/-0.050 OHM	R3305	0613952R17	CER CHIP RES 47K OHM 5% 0402	R3507	0613952H15	CER CHIP RES 3.9 OHM 5 0603	R3702	NOTPLACED	GCAM DUMMY PART NUMBER
R3220	NOTPLACED	GCAM DUMMY PART NUMBER	R3306	0613952Q81	CER CHIP RES 2200 OHM 5 0402	R3512	NOTPLACED	GCAM DUMMY PART NUMBER	R3703	0613952Q53	CER CHIP RES 150 OHM 5 0402
R3221	0613952Q42	CER CHIP RES 51.0 OHM 5 0402	R3307	0613952R13	CER CHIP RES 33K OHM 5% 0402	R3513	NOTPLACED	GCAM DUMMY PART NUMBER	R3704	0613952Q53	CER CHIP RES 150 OHM 5 0402
R3222	0613952Q69	CER CHIP RES 680 OHM 5 0402	R3308	0613952Q77	CER CHIP RES 1500 OHM 5 0402	R3519	0615043C01	POWER METAL STRIP RESISTORS	R3705	0613952R13	CER CHIP RES 33K OHM 5% 0402
R3223	0613952N09	CER CHIP RES 12.1K OHM 1 0402	R3309	0613952Q94	CER CHIP RES 7500 OHM 5 0402	R3541	0613952R15	CER CHIP RES 39K OHM 5% 0402	R3721	0613952Q65	CER CHIP RES 470 OHM 5 0402
R3224	0613952N01	CER CHIP RES 10.0K OHM 1 0402	R3310	0613952Q83	CER CHIP RES 2700 OHM 5 0402	R3542	0613952Q91	CER CHIP RES 5600 OHM 5 0402	R3722	0613952Q67	CER CHIP RES 560 OHM 5 0402
R3226	0613952Q63	CER CHIP RES 390 OHM 5 0402	R3311	NOTPLACED	GCAM DUMMY PART NUMBER	R3543	0613952Q49	CER CHIP RES 100 OHM 5 0402	R3723	0613952Q49	CER CHIP RES 100 OHM 5 0402
R3270	0613952Q73	CER CHIP RES 1000 OHM 5 0402	R3312	0613952Q18	CER CHIP RES 5.1 OHM 5 0402	R3544	0613952H49	CER CHIP RES 100 OHM 5% 0603	R3726	NOTPLACED	GCAM DUMMY PART NUMBER
R3271	NOTPLACED	GCAM DUMMY PART NUMBER	R3313	0613952Q39	CER CHIP RES 39.0 OHM 5 0402	R3545	0613952H49	CER CHIP RES 100 OHM 5% 0603	R3727	0613952R25	CER CHIP RES 100K OHM 5% 0402
R3273	0613952R05	CER CHIP RES 15K OHM 5% 0402	R3314	0613952Q34	CER CHIP RES 24.0 OHM 5 0402	R3546	0613952R03	CER CHIP RES 12K OHM 5% 0402	R3741	0613952Q49	CER CHIP RES 100 OHM 5 0402

Circuit Ref	Motorola Part No.	Description
R3751	0613952R32	CER CHIP RES 200K OHM 5 0402
R3752	0613952R31	CER CHIP RES 180K OHM 5% 0402
R3761	0613952R17	CER CHIP RES 47K OHM 5% 0402
R3762	NOTPLACED	GCAM DUMMY PART NUMBER
R3801	NOTPLACED	GCAM DUMMY PART NUMBER
R3802	0613952Q49	CER CHIP RES 100 OHM 5 0402
R3803	0613952Q57	CER CHIP RES 220 OHM 5 0402
R3804	0613952R01	CER CHIP RES 10K OHM 5% 0402
R3805	0613952R10	CER CHIP RES 24K OHM 5 0402
R3806	0613952Q33	CER CHIP RES 22.0 OHM 5 0402
R3807	NOTPLACED	GCAM DUMMY PART NUMBER
R3808	0613952Q25	CER CHIP RES 10.0 OHM 5 0402
R3811	0613952Q49	CER CHIP RES 100 OHM 5 0402
R3812	NOTPLACED	GCAM DUMMY PART NUMBER
R3816	0613952Q73	CER CHIP RES 1000 OHM 5 0402
R3817	0613952R66	CER CHIP RES 0.0 +/-0.050 OHM
R3818	NOTPLACED	GCAM DUMMY PART NUMBER
R3821	0613952Q57	CER CHIP RES 220 OHM 5 0402
R3822	0613952Q41	CER CHIP RES 47.0 OHM 5 0402
R3823	0613952R13	CER CHIP RES 33K OHM 5% 0402
R3824	0613952R09	CER CHIP RES 22K OHM 5% 0402
R3825	0613952Q37	CER CHIP RES 33.0 OHM 5 0402
R3826	0613952Q31	CER CHIP RES 18.0 OHM 5 0402
R3828	0613952Q49	CER CHIP RES 100 OHM 5 0402
R3829	0613952R66	CER CHIP RES 0.0 +/-0.050 OHM

Circuit Ref	Motorola Part No.	Description
R3830	NOTPLACED	GCAM DUMMY PART NUMBER
R3831	0613952R01	CER CHIP RES 10K OHM 5% 0402
R3832	0613952R03	CER CHIP RES 12K OHM 5% 0402
R3833	0613952Q57	CER CHIP RES 220 OHM 5 0402
R3834	0613952Q41	CER CHIP RES 47.0 OHM 5 0402
R3835	0613952R17	CER CHIP RES 47K OHM 5% 0402
R3836	0613952R01	CER CHIP RES 10K OHM 5% 0402
R501	0613952Q69	CER CHIP RES 680 OHM 5 0402
R502	0613952Q55	CER CHIP RES 180 OHM 5 0402
R505	0613952R01	CER CHIP RES 10K OHM 5% 0402
R506	0613952R17	CER CHIP RES 47K OHM 5% 0402
R509	0613952R66	CER CHIP RES 0.0 +/-0.050 OHM
RT3301	NOTPLACED	GCAM DUMMY PART NUMBER
S501	4080710Z21	SWITCH, FREQUENCY
S502	1880619Z06	POTENTIOMETER, VOLUME
SH3202	2686539Z02	IF SECTION SHIELD
SH3203	2615924H01	SHIELD, CRYSTAL FILTER
SH3301	2615144H01	SHIELD FOR GSM PLACEMENT
SH3302	2615144H05	SHIELD FOR GSM PLACEMENT
SH3303	2615144H06	SHIELD FOR GSM PLACEMENT
SH3501	2615144H03	SHIELD FOR GSM PLACEMENT
SH3502	2615144H04	SHIELD FOR GSM PLACEMENT
SH3701	2680511Z02	SHIELD, SYNTHESIZER
SH3702	2680511Z02	SHIELD, SYNTHESIZER
SH3801	2680513Z02	SHIELD, VCO TOP
SH3802	2680514Z02	SHIELD, VCO BOTTOM/ LVZIF
T3301	2515121H01	BALUN, TRANSFORMER W18 COMP
T3302	2515121H01	BALUN, TRANSFORMER W18 COMP
U3201	5115019H01	3.3V REGULATOR IN SOT23-5 PKG

Circuit Ref	Motorola Part No.	Description
U3220	5115281H01	FM IF IC SA616 FROM PHILIPS
U3221	5115070H01	IC 3-INV LMOS TC7W04FU
U3222	5114005A01	IC,OP AMP,2PER PKG,SO-8,LOW
U3501	5115678H01	VHF/UHF/800/900 MHZ LDMOS DRIV
U3502	5185765B26	IC PWR CTRL IN MOS20
U3503	5115022H01	IC TEMPERATURE SENSOR
U3701	5185177Y01	IC TESTED AT25016 48 PIN W18
U3711	5115026H01	MAX SUPPLY VOL 16V
U3801	5105750U56	IC PKG DIE VCO BUFFER
VR3501	4813977M21	DIODE,ZEN,MBZ5242,SM,S OT-23,12
VR439	4813977M21	DIODE,ZEN,MBZ5242,SM,S OT-23,12
VR440	NOTPLACED	GCAM DUMMY PART NUMBER
VR441	NOTPLACED	GCAM DUMMY PART NUMBER
VR444	NOTPLACED	GCAM DUMMY PART NUMBER
VR501	4815038H01	ZENER DIODE-6.8V
VR506	4815038H01	ZENER DIODE-6.8V
Y3200	9180022M11	XTAL FILTER 44.85MHZ
Y3201	4802245J84	XTAL 44.395MHZ, 3RD OT, SMD
Y3202	9186145B02	CER.DISCR. CDBCA455CX36-TC
Y3203	9115811H03	SMD455KHZ 6 ELEMENT
Y3204	9115811H01	SMD455KHZ 6 ELEMENT
Y3205	9180468V04	SMD455KHZ 4 ELEMENT CER FLTR
Y3761	4805875Z04	CRYSTAL 16.8 MHZ

* Motorola Depot Servicing only

** Not Servicable

7.1 UHF Band 1, Circuit Board/Schematic Diagrams and Parts List

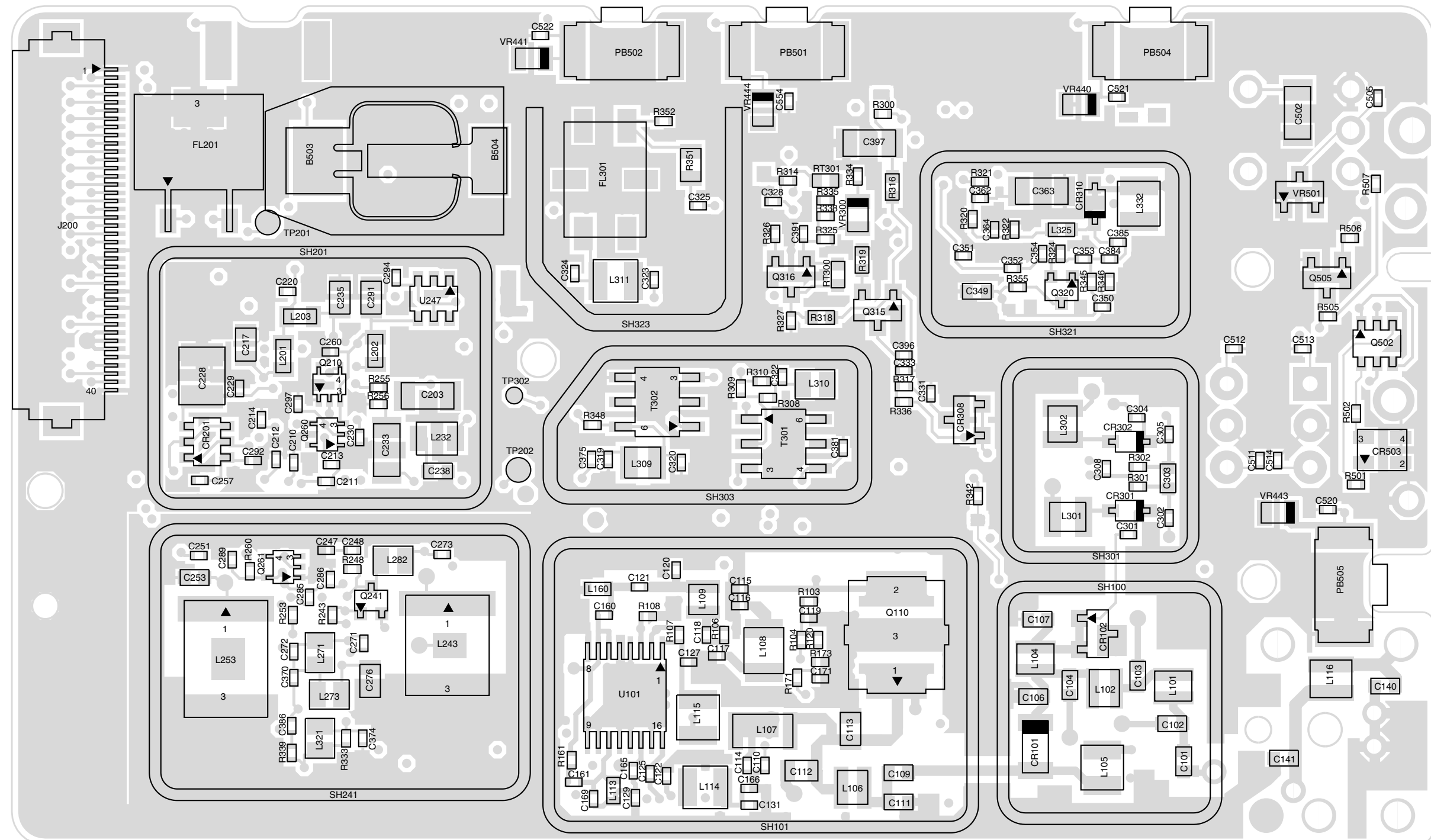


Figure 7-1: UHF (403-470MHz) Main Board Top Side PCB No. 8404077G01

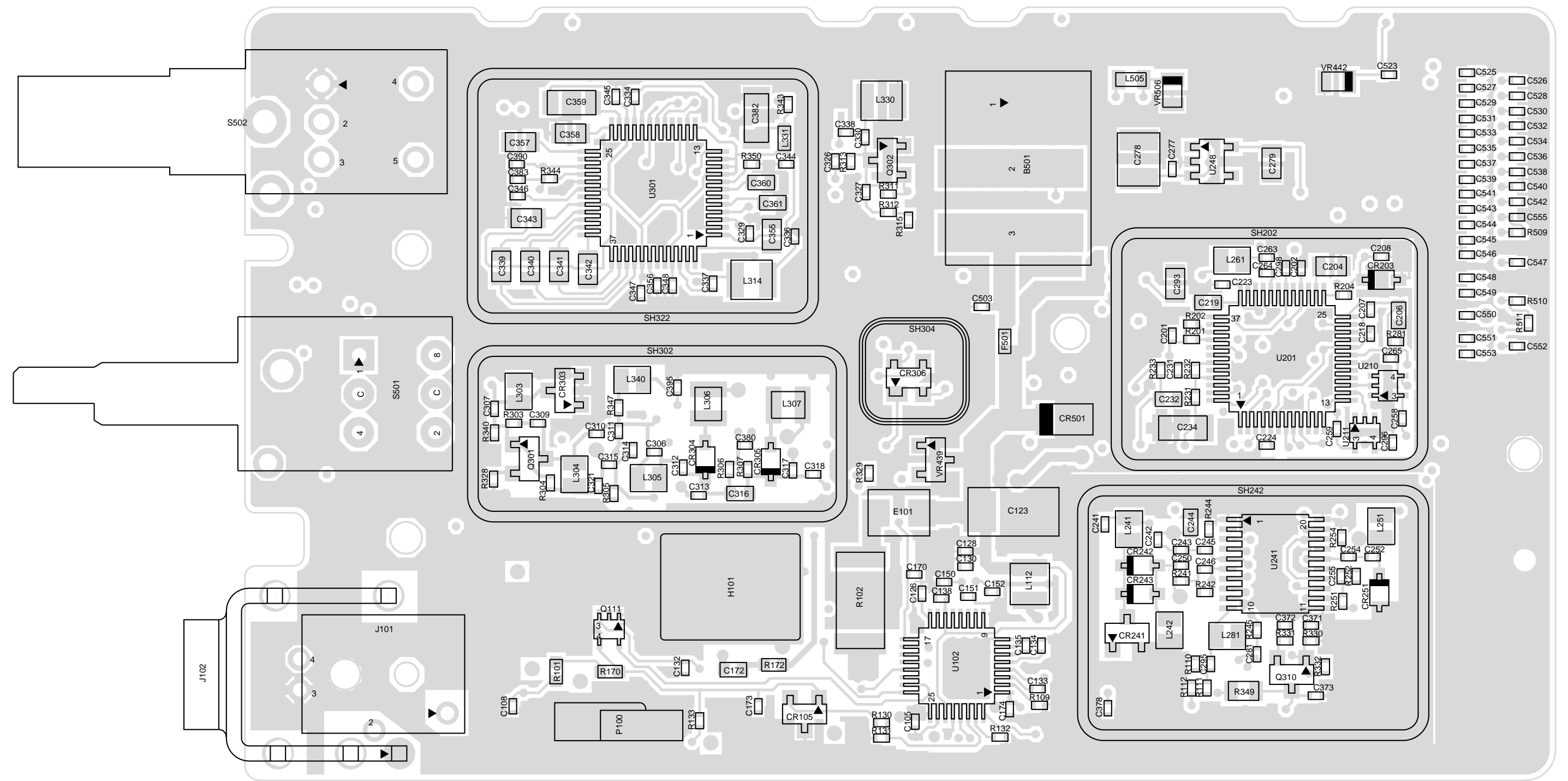
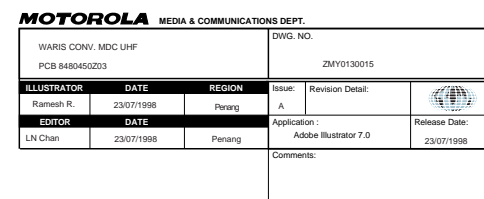
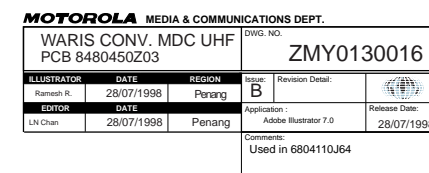


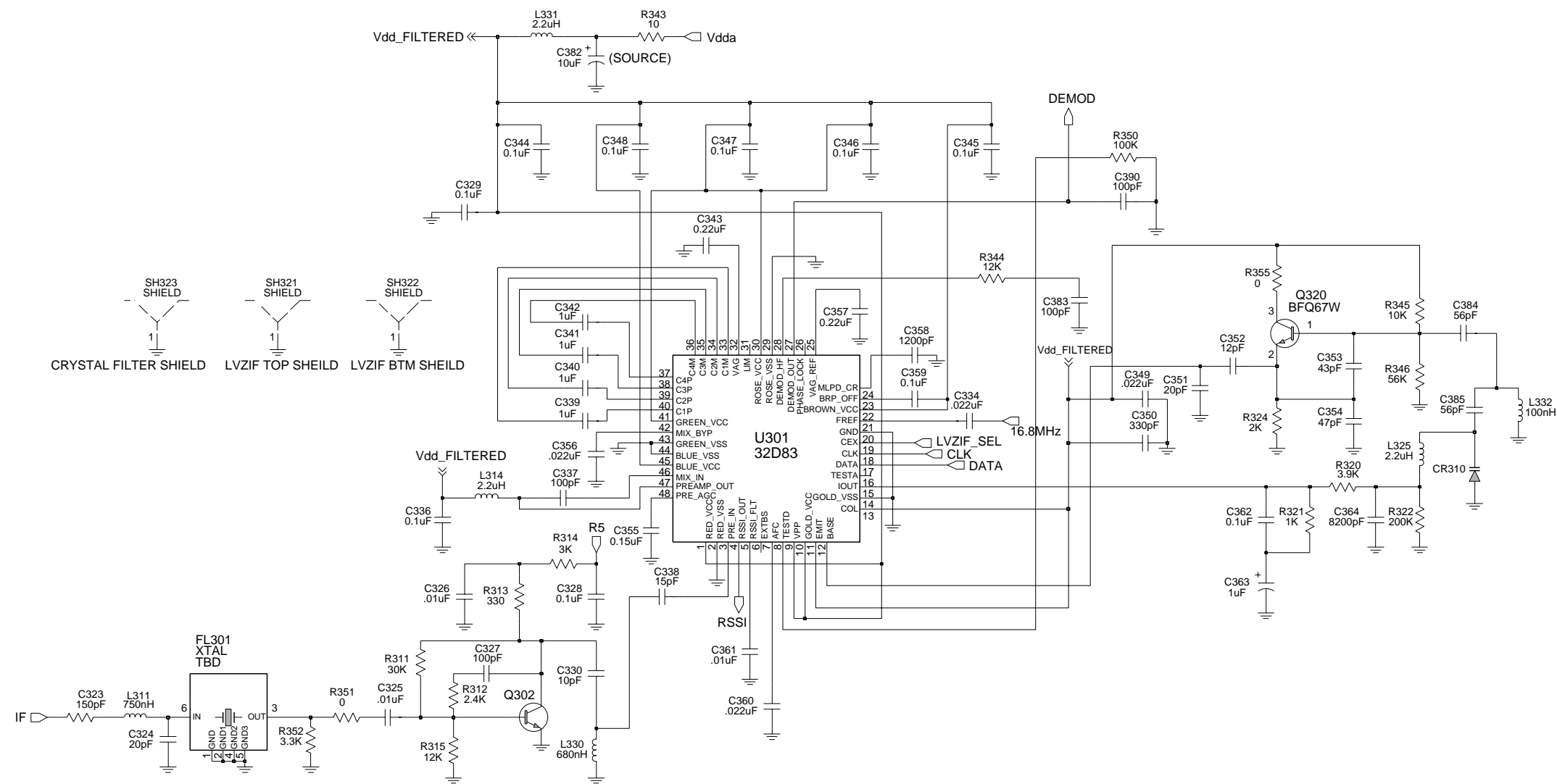
Figure 7-2: UHF (403-470MHz) Main Board Bottom Side PCB No. 8404077G01






Main Board, RF Section-- Receiver Frontend

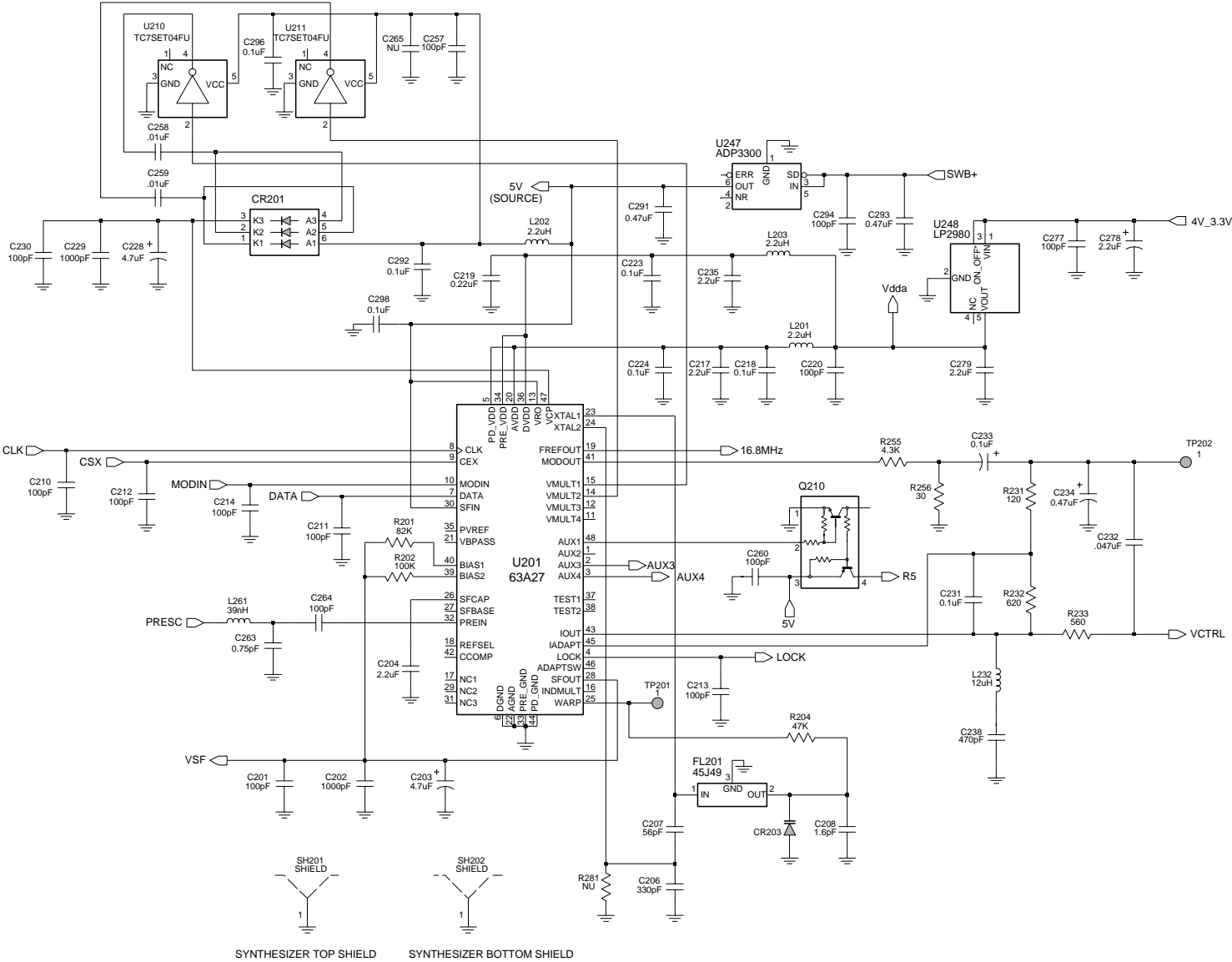
Figure 7-4: UHF Receiver Front End Schematic Diagram



MOTOROLA MEDIA & COMMUNICATIONS DEPT.					
WARIS CONV. MDC UHF PCB 8480450Z03				DWG. NO. ZMY0130014	
ILLUSTRATOR	DATE	REGION	Issue:	Revision Detail:	
Ramesh R.	24/07/1998	Penang	A		
EDITOR	DATE	REGION	Application:	Release Date:	
LN Chan	24/07/1998	Penang	Adobe Illustrator 7.0	24/07/1998	
Comments: Used in 6804110J64					

Main Board, RF Section-- Receiver Backend

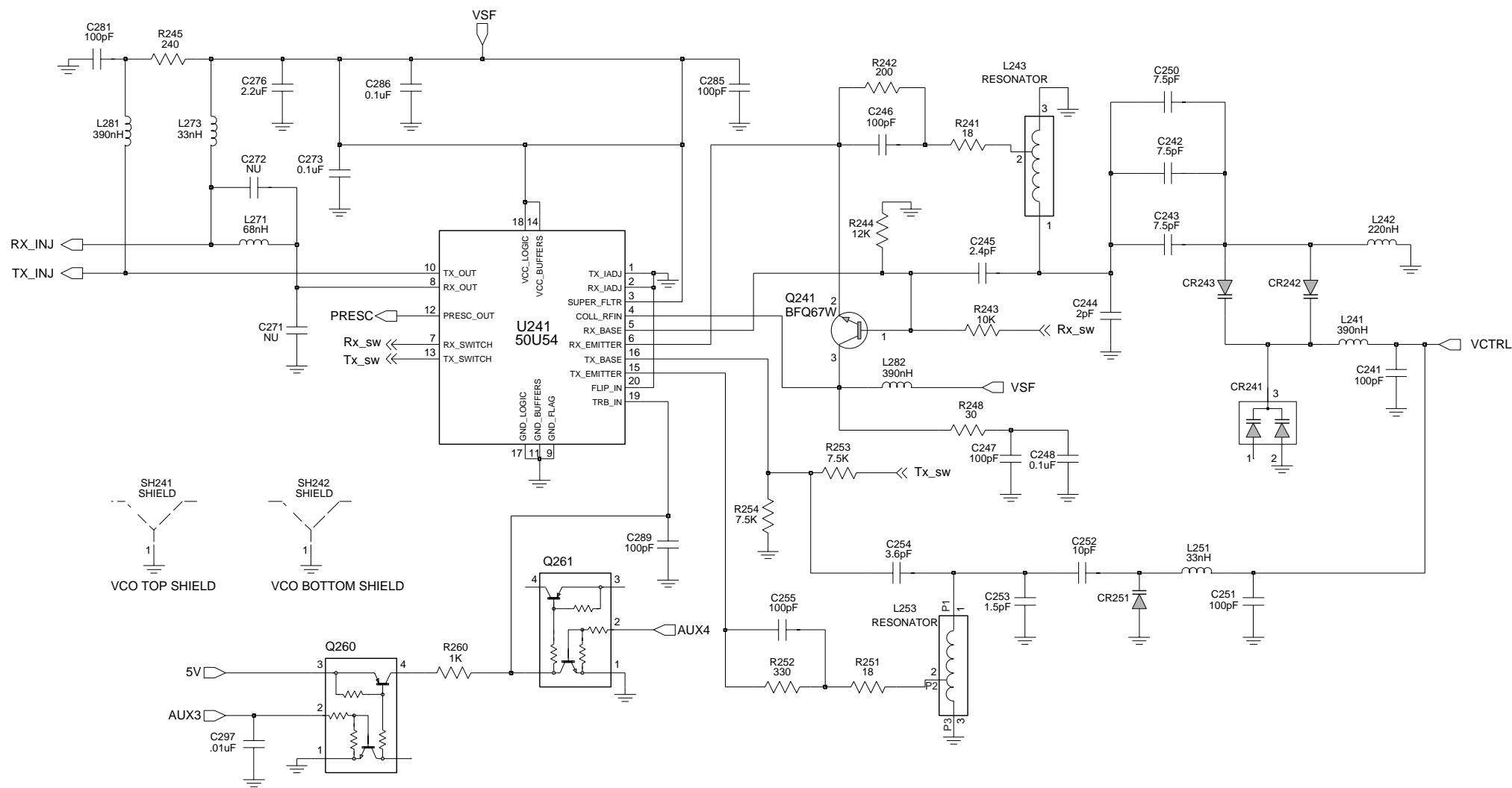
Figure 7-5: UHF Receiver Back End Schematic Diagram







MOTOROLA MEDIA & COMMUNICATIONS DEPT.			
WARIS CONV. MDC UHF PCB 8480450Z03		DWG. NO. ZMY0130017	
ILLUSTRATOR	DATE	REGION	Issue: Revision Detail
Ramesh R.	24/07/1998	Penang	A
EDITOR	DATE	REGION	Application: Release Date
LN Chan	24/07/1998	Penang	Adobe Illustrator 6.0 24/07/1998
Comments: Used in 680411QJ64			

Main Board, RF Section-- Synthesizer

Figure 7-6: UHF Synthesizer Schematic Diagram



MOTOROLA MEDIA & COMMUNICATIONS DEPT.			
WARIS CONV. MDC UHF PCB 8480450Z03			DWG. NO. ZMY0130019
ILLUSTRATOR	DATE	REGION	Issue:  Revision Detail: 
Ramesh R.	23/07/1998	Penang	
EDITOR	DATE	REGION	Application:  Release Date: 
LN Chan	23/07/1998	Penang	23/07/1998
Comments: Used in 6804110J64			

Main Board, RF Section-- Voltage Controlled Oscillator

Figure 7-7: UHF Voltage Controlled Oscillator Schematic Diagram

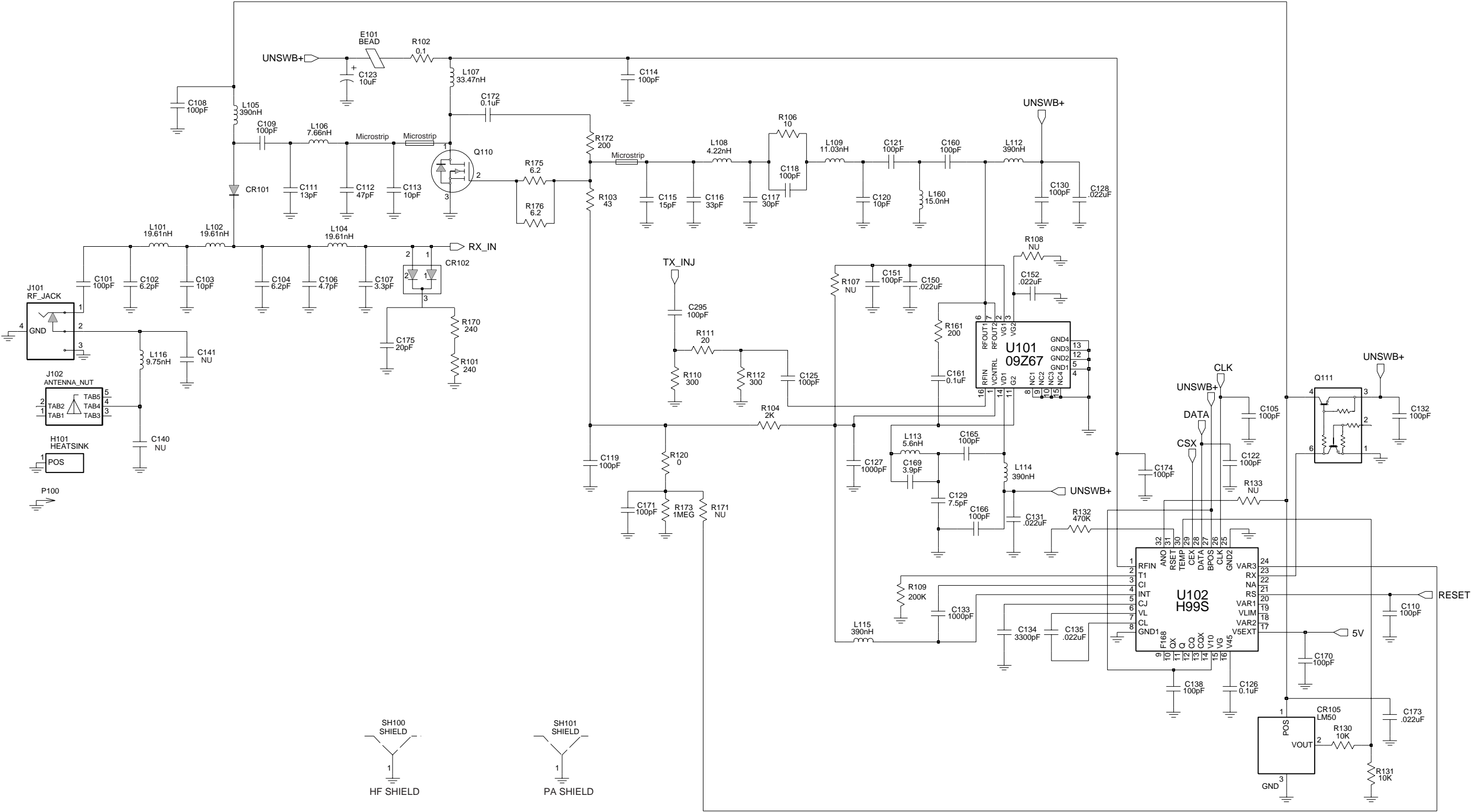


Figure 7-8: UHF Transmitter Schematic Diagram

UHF Band 1 Radio Parts List

Circuit Ref	Motorola Part No.	Description
B501	0986237A02	Battery Contact Module
B503	3980502Z01	Backup Battery Contact, B+ (not used in GP328 Plus)
B504	3980501Z01	Backup Battery Contact, B- (not used in GP328 Plus)
C101	2113740F51	100
C102	2113740F22	6.2
C103	2113740F27	10
C104	2113740F22	6.2
C105	2113743N50	100pF
C106	2113740F19	4.7pF
C107	2113740F15	3.3
C108	2113743N50	100pF
C109	2113740F51	100
C110	2113743N50	100pF
C111	2113740F30	13
C112	2180605Z32	47pF
C113	2180605Z16	10pF
C114	2113743N50	100pF
C115	2113743N32	18pF
C116	2113743N38	33.0pF
C117	2113743N34	22pF
C118	2113743N50	100pF
C119	2113743N50	100pF
C120	2113743N27	11pF
C121	2113743N50	100pF
C122	2113743N50	100pF
C123	2311049A18	10UF
C125	2113743N50	100pF
C126	2113743M24	0.1UF,+80%/-20%
C127	2113743L17	1000pF,10%
C128	2113743M08	22000pF
C129	2113743N23	7.5pF
C130	2113743N50	100pF
C131	2113743M08	22000pF
C132	2113743N50	100pF
C133	2113743L17	1000pF,10%
C134	2113743L29	3300pF
C135	2113743M08	22000pF
C138	2113743N50	100pF
C150	2113743M08	22000pF
C151	2113743N50	100pF
C152	2113743M08	22000pF
C160	2113743N50	100pF
C161	2113743M24	0.1UF,+80%/-20%
C165	2113743N50	100pF
C166	2113743N50	100pF
C169	2113743N20	5.6pF
C170	2113743N50	100pF

Circuit Ref	Motorola Part No.	Description
C171	2113743N50	100pF
C172	2113743E20	10UF
C173	2113743M08	22000pF
C174	2113743N50	100pF
C175	2113740F51	100pF
C201	2113743N50	100pF
C202	2113743L17	1000pF,10%
C203	2311049A56	4.7UF
C204	2104993J02	2.2UF
C206	2113740F63	330
C207	2113743N40	39.0pF
C208	2113743N08	1.6pF
C210	2113743N50	100pF
C211	2113743N50	100pF
C212	2113743N50	100pF
C213	2113743N50	100pF
C214	2113743N50	100pF
C217	2104993J02	2.2UF
C218	2113743M24	0.1UF,+80%/-20%
C219	2113743K16	0.220UF,+80%/-20%
C220	2113743N50	100pF
C223	2113743M24	0.1UF,+80%/-20%
C224	2113743M24	0.1UF,+80%/-20%
C228	2311049J11	4.7UF
C229	2113743L17	1000pF,10%
C230	2113743N50	100pF
C231	2113743M24	0.1UF,+80%/-20%
C232	2113743E12	0.047UF
C233	2311049A01	0.1UF
C234	2311049A05	0.47UF
C235	2104993J02	2.2UF
C238	2113741F17	470
C241	2113743N50	100pF
C242	2113743N23	7.5pF
C243	2113743N23	7.5pF
C244	2113740F10	2
C245	2113743N11	2.4pF
C246	2113743N50	100pF
C247	2113743N50	100pF
C248	2113743M24	0.1UF,+80%/-20%
C250	2113743N23	7.5pF
C251	2113743N50	100pF
C252	2113743N26	10.0pF
C253	2113740F09	1.8
C254	2113743N15	3.6pF
C255	2113743N50	100pF
C257	2113743N50	100pF
C258	2113743L41	1000pF
C259	2113743L41	1000pF
C260	2113743N50	100pF
C263	2113743N02	0.75pF

Circuit Ref	Motorola Part No.	Description
C264	2113743N50	100pF
C273	2113743M24	0.1UF,+80%/-20%
C276	2104993J02	2.2UF
C277	2113743N50	100pF
C278	2311049A09	2.2UF
C279	2104993J02	2.2UF
C281	2113743N50	100pF
C285	2113743N50	100pF
C286	2113743M24	0.1UF,+80%/-20%
C289	2113743N50	100pF
C291	2311049A69	10.0UF
C292	2113743M24	0.1UF,+80%/-20%
C293	2113743A27	0.470UF
C294	2113743N50	100pF
C295	2113743N50	100pF
C296	2113743M24	0.1UF,+80%/-20%
C297	2113743L41	1000pF
C298	2113743M24	0.1UF,+80%/-20%
C301	2113743N15	3.6pF
C302	2113743N26	10.0pF
C303	2113740L08	3.9pF
C304	2113743N26	10.0pF
C305	2113743N33	20.0pF
C307	2113743M24	0.1UF,+80%/-20%
C308	2113743N50	100pF
C309	2113743N50	100pF
C310	2113743M24	0.1UF,+80%/-20%
C312	2113743N25	9.1pF
C313	2113743N26	10.0pF
C314	2113743M24	0.1UF,+80%/-20%
C315	2113743N50	100pF
C316	2113740L08	1200pF
C317	2113743N25	9.1pF
C318	2113743N23	7.5pF
C319	2113743N69	1.8pF
C320	2113743N23	7.5pF
C321	2113743N50	100pF
C322	2113743N48	82.0pF
C323	2113743N54	150pF
C324	2113743N33	20.0pF
C325	2113743L41	1000pF
C326	2113743L41	1000pF
C327	2113743N50	100pF
C328	2113743M24	0.1UF,+80%/-20%
C329	2113743M24	0.1UF,+80%/-20%
C330	2113743N26	10.0pF
C331	2113743N50	100pF
C334	2113743M08	22000pF
C336	2113743M24	0.1UF,+80%/-20%
C337	2113743N50	100pF
C338	2113743N30	15.0pF

Circuit Ref	Motorola Part No.	Description
C339	2180478Z20	1.0UF
C340	2180478Z20	1.0UF
C341	2180478Z20	1.0UF
C342	2180478Z20	1.0UF
C343	2113743A23	0.220UF,10%
C344	2113743M24	0.1UF,+80%/-20%
C345	2113743M24	0.1UF,+80%/-20%
C346	2113743M24	0.1UF,+80%/-20%
C347	2113743M24	0.1UF,+80%/-20%
C348	2113743M24	0.1UF,+80%/-20%
C349	2113743E07	0.022UF,10%
C350	2113743L05	330pF,10%
C351	2113743N33	20.0pF
C352	2113743N28	12.0pF
C353	2113743N41	43.0pF
C354	2113743N42	47.0pF
C355	2113743A24	0.330UF
C356	2113743M08	22000pF
C357	2113743A23	0.220UF,10%
C358	2113741A23	1200pF
C359	2109720D14	0.1UF
C360	2113743E07	0.022UF,10%
C361	2113741F49	10NF
C362	2113743M08	22000pF
C363	2311049A40	2.2UF
C364	2113743L41	1000pF
C370	2113743N50	100pF
C374	2113743N50	100pF
C375	2113743N50	100pF
C380	2113743L41	1000pF
C381	2113743N21	6.2pF
C382	2311049A59	10UF
C383	2113743N50	100pF
C384	2113743N44	56.0pF
C385	2113743N44	56.0pF
C386	2113743N50	100pF
C390	2113743N50	100pF
C395	2113743N50	100pF
C397	2311049A05	0.47UF
CR101	4880973Z02	PIN DIODE
CR102	4802245J41	PIN DIODE
CR105	5185963A15	Temperature Sense
CR201	4802233J09	Triple Diode
CR203	4862824C03	Varactor
CR241	4805649Q13	DUAL Varactor
CR242	4862824C01	Varactor
CR243	4862824C01	Varactor
CR251	4802245J22	Varactor
CR301	4862824C01	Varactor
CR302	4862824C01	Varactor

Circuit Ref	Motorola Part No.	Description
CR303	4880154K03	DUAL COMMON ANODE-CATHODE
CR304	4862824C01	Varactor
CR305	4862824C01	Varactor
CR306	4802245J42	RING QUAD DIODE
CR308	4802245J41	PIN DIODE
CR310	4862824C01	Varactor
CR501	4880107R01	Rectifier
CR503	4805729G49	LED RED/YEL
E101	2484657R01	Ferrite Bead
F501	6580542Z01	FUSE 3A
FL201	4805875Z04	16.8MHZ XTAL (Clip)
FL301	4802245J43	Xtal Filter 45.1 MHZ
H101	2680499Z01	Heat Spreader
J101	0985613Z01	RF Jack
J102	0280519Z02	Antenna Nut
J200	0905505Y04	40-Pins Connector
L101	2479990B02	19.61NH,10%
L102	2479990B02	19.61NH,10%
L104	2479990B02	19.61NH,10%
L105	2462587N22	390 NH ,10%
L106	2479990A02	7.66NH,10%
L107	2479990G01	33.47NH
L108	2479990A01	4.22NH,10%
L109	2479990B01	11.03NH
L112	2462587N45	22 NH ,5%
L113	2413926H09	5.6NH
L114	2462587N45	22 NH ,5%
L115	2462587N22	393 NH ,10%
L116	2479990A03	9.75NH,10%
L160	2413926H14	15.0 NH
L201	2462587Q20	2.2uH,20%
L202	2462587Q20	2.2uH,20%
L203	2462587Q20	2.2uH,20%
L232	2462587P25	12000 NH
L241	2462587V41	390NH,10%
L242	2462587V38	220NH,5%
L243	2460593C01	Teflon Resonator
L251	2462587V28	33NH,5%
L253	2460593C02	Teflon Resonator
L261	2462587V29	39NH,5%
L271	2462587V32	68NH
L273	2462587V28	33NH,5%
L281	2462587V41	390NH,10%
L282	2462587V41	390NH,10%
L301	2479990C01	13.9NH,10%
L302	2479990C01	13.9NH,10%
L303	2462587V26	22NH
L304	2462587V37	180NH,5%
L305	2462587V26	22NH
L306	2479990C01	13.9NH,10%

Circuit Ref	Motorola Part No.	Description
L307	2479990C01	13.9NH,10%
L309	2479990C02	16.28NH
L310	2462587V36	150NH,5%
L311	2462587N65	750NH,5%
L314	2462587N72	2.2uH,5%
L325	2480646Z20	2.20UH
L330	2462587N64	680NH,5%
L331	2480646Z20	2.20UH
L332	2462587N53	100NH,5%
L340	2462587V41	390NH,10%
L400	2462587Q42	390NH 10%
L401	2462587Q42	390NH 10%
L410	2462587Q42	390NH 10%
L411	2462587Q42	390NH 10%
L505	2462587Q42	390NH,10%
P100	3905643V01	Gnd Contact Finger
PB501	4070354A01	Tact Switch
PB502	4070354A01	Tact Switch
PB504	4070354A01	Tact Switch
PB505	4070354A01	Tact Switch
Q110	4813828A09	RF Power FET
Q111	4802245J50	DUAL NPN
Q210	4802245J50	DUAL NPN
Q241	4805218N63	NPN Transistor
Q260	4802245J50	DUAL NPN
Q261	4802245J50	DUAL NPN
Q301	4802245J44	Npn
Q302	4802245J44	Npn
Q315	4880214G02	NPN
Q320	4805218N63	NPN Transistor
Q502	5180159R01	Dual NPN
Q505	4880214G02	NPN
R101	0662057A34	240
R102	0680735Z01	0.075
R103	0662057M41	43
R104	0662057N15	47K
R106	0662057M26	10
R108	0662057M92	5.6K
R109	0662057N30	200K
R110	0662057M61	300
R111	0662057M33	20
R112	0662057M61	300
R120	0662057N14	43K
R130	0662057M98	10K
R131	0662057N05	18K
R132	0662057N33	270K
R161	0662057M57	200
R170	0662057A34	240
R171	0662057N14	43K
R172	0662057A32	200
R173	0662057N29	180K

Circuit Ref	Motorola Part No.	Description
R175	0662057B59	3.0 ohm
R176	0662057B59	3.0 ohm
R201	0662057N21	82K
R202	0662057N23	100K
R204	0662057N15	47K
R231	0662057M52	120
R232	0662057M69	620
R233	0662057M68	560
R241	0662057M32	18
R242	0662057M57	200
R243	0662057M98	10K
R244	0662057N01	12K
R245	0662057M59	240
R248	0662057M37	30
R251	0662057M32	18
R252	0662057M62	330
R253	0662057M95	7.5K
R254	0662057M95	7.5K
R255	0662057M89	4.3K
R256	0662057M37	30
R260	0662057M74	1K
R300	0662057M82	2.2K
R301	0662057N23	100K
R302	0662057N23	100K
R303	0662057M74	1K
R304	0662057N01	12K
R305	0662057M67	510
R306	0662057N23	100K
R307	0662057N23	100K
R308	0662057M60	270
R309	0662057M32	18
R310	0662057M60	270
R311	0662057N10	30K
R312	0662057M83	2.4K
R313	0662057M62	330
R314	0662057M85	3K
R315	0662057N01	12K
R316	0662057A96	91K
R317	0662057M74	1K
R318	0662057A79	18K
R319	0662057A29	150
R320	0662057M74	1K
R321	0662057M83	2.4K
R322	0662057N30	200K
R324	0662057M81	2K
R325	0662057M94	6.8K
R327	0662057N11	33K
R328	0662057M12	2.7
R329	0662057M01	0
R339	0662057M01	0
R340	0662057M94	6.8K

Circuit Ref	Motorola Part No.	Description
R342	0662057N23	100K
R343	0662057M26	10
R344	0662057N01	12K
R345	0662057M98	10K
R346	0662057N17	56K
R347	0662057M74	1K
R348	0662057M87	3.6K
R349	0662057C01	0
R350	0662057N23	100K
R351	0662057C01	0
R352	0662057M86	3.3K
R355	0662057M01	0
R509	0662057M01	0
RT300	0680590Z01	33K
RT400	0680590Z01	Thermistor 33K
S501	4080710Z01	Channel Switch
	4080710Z02	**Frequency Switch
S502	1880619Z02	Volume Switch
SH100	2680507Z01	Harmonic Filter Shield
SH101	2680510Z01	PA Shield
SH201	2680511Z01	Synthesizer Top Shield
SH202	2680511Z01	Synthesizer Bottom Shield
SH241	2604120G01	Vco Top Shield
SH242	2680514Z01	Vco Bottom Shield
SH301	2680554Z01	Rx Pre-Filter Shield
SH302	2680555Z01	Rx Post-Filter/RF Amp Shield
SH303	2680509Z01	Mixer Shield
SH304	2680624Z01	Mixer Diode Shield
SH321	2680508Z01	ZIF 2nd LO Shield
SH322	2680514Z01	ZIF Shield
SH323	2604082P01	Xtal Filter Shield
T301	2580541Z02	Xfmr Coil
T302	2580541Z02	Xfmr Coil
U101	5185130C65	LDMOS DRIVER
U102	5185765B28	Power Control IC
U201	5185963A27	LVFRACN
U210	5102463J61	INVERTER
U211	5102463J61	INVERTER
U241	5105750U54	VCO BUFFER
U247	5105739X05	REGULATOR LINEAR
U248	5102463J58	3.3V REG
U301	5109632D83	LVZIF

* Motorola Depot Servicing only
** For EX600 XLS models only

7.2 UHF Band 1, Circuit Board/ Schematic Diagrams and Parts List (PCB No. 8471441L01)

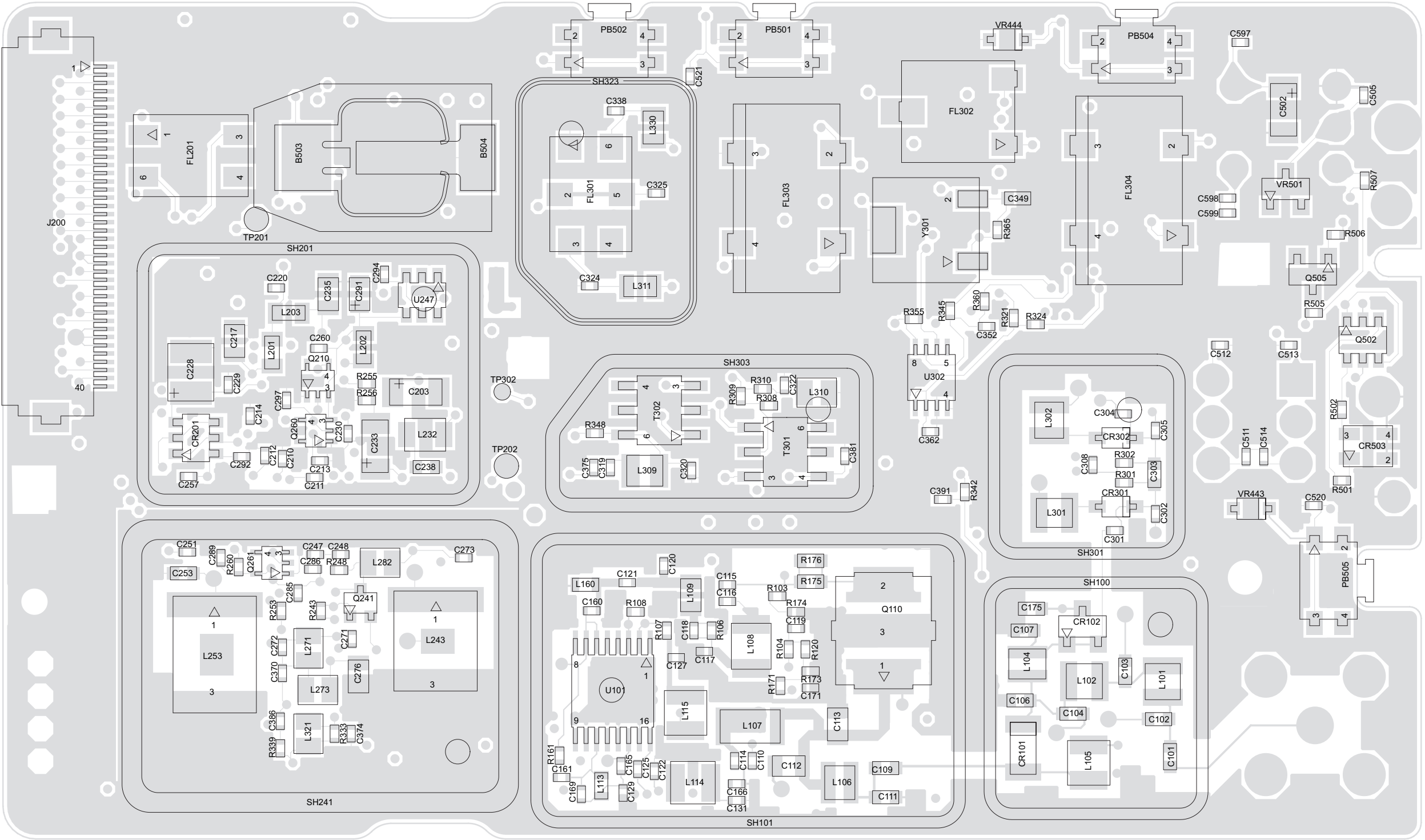


Figure 7-9: UHF (403-470MHz) Main Board Top Side PCB No. 8471441L01

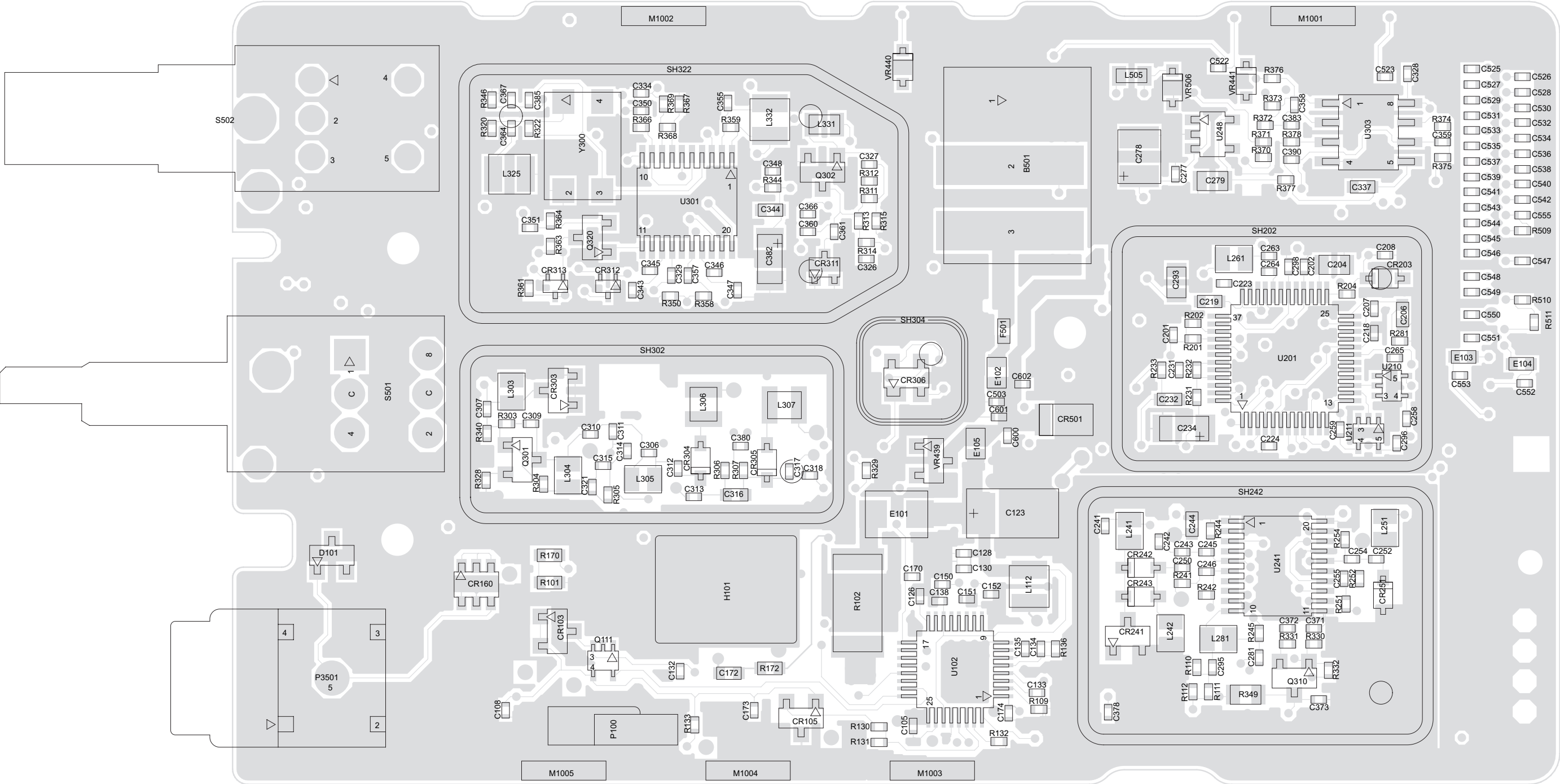


Figure 7-10: UHF (403-470MHz) Main Board Bottom Side PCB No. 8471441L01

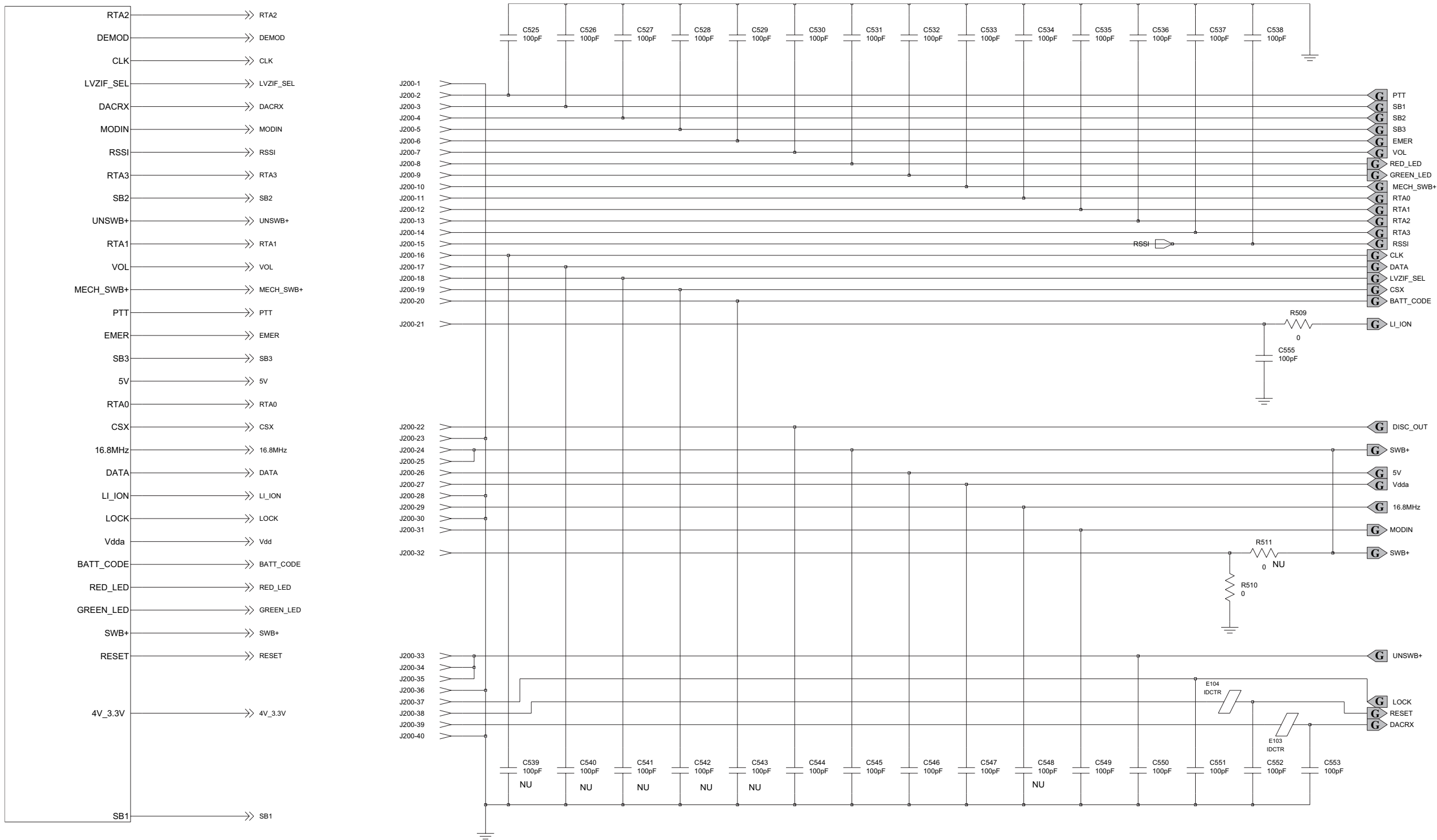


Figure 7-11: UHF Controls And Switches Schematic Diagram for PCB No. 8471441L01 (sheet 1 of 2)

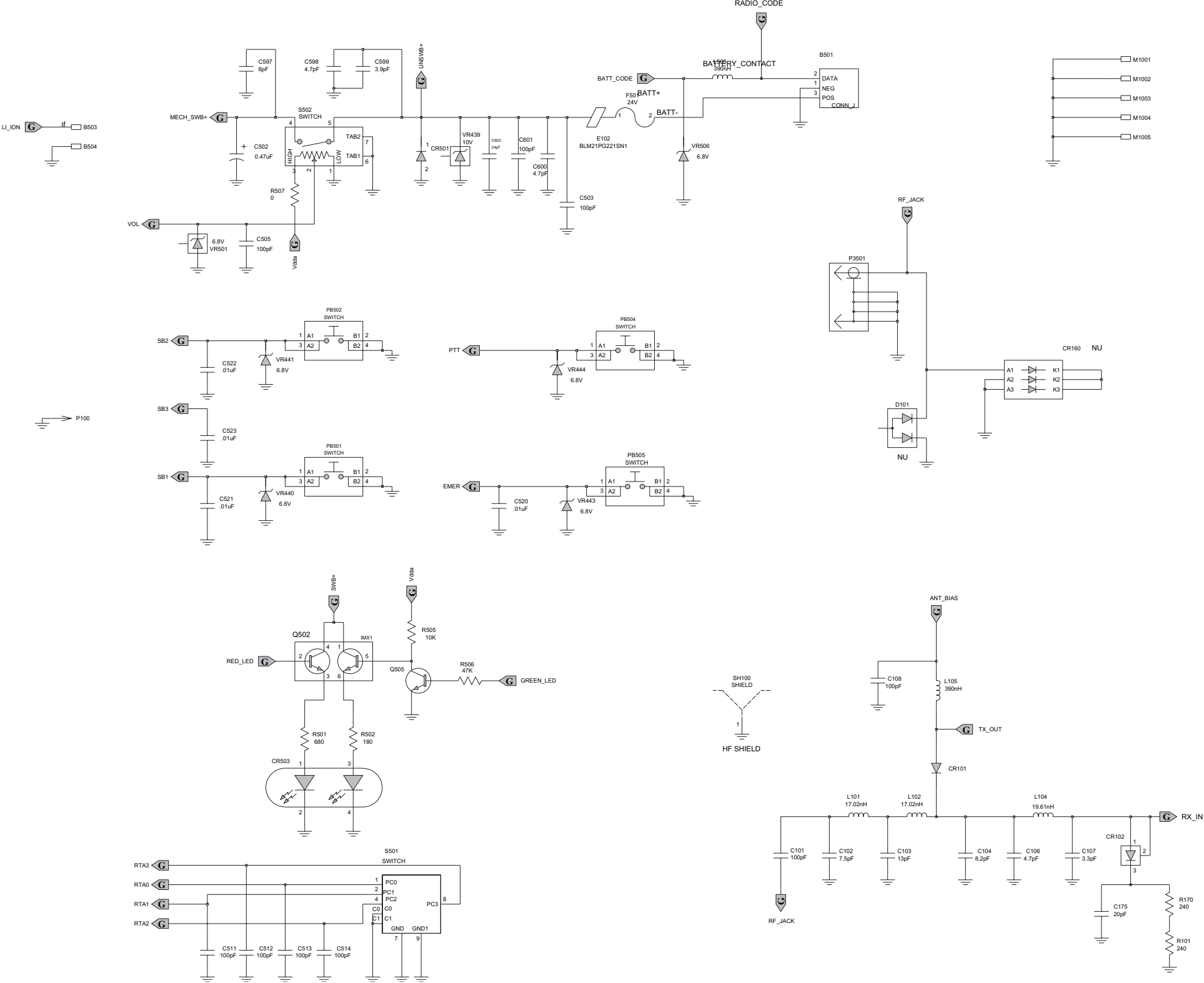


Figure 7-12: UHF Controls And Switches Schematic Diagram for PCB No. 8471441L01 (sheet 2 of 2)

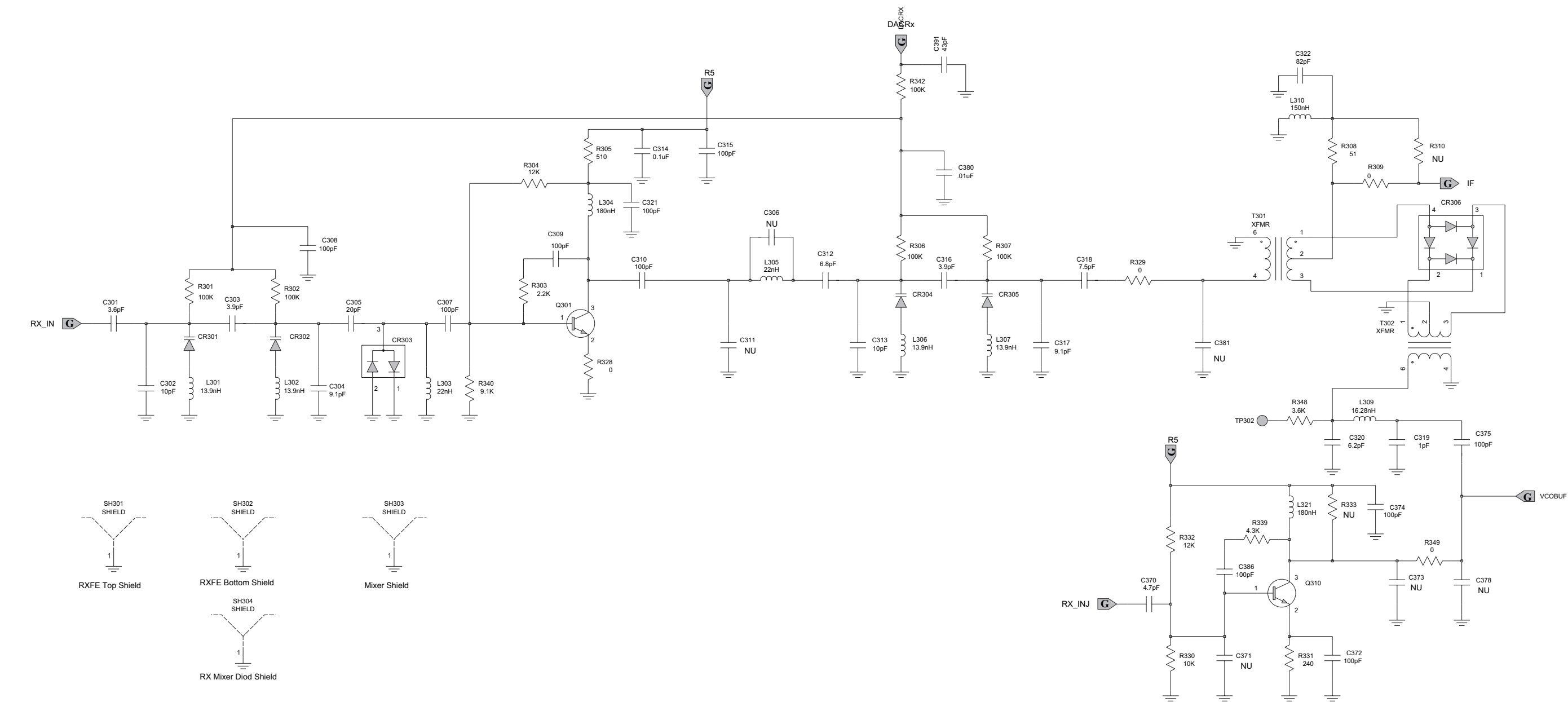


Figure 7-13: UHF Receiver Front End Schematic Diagram for PCB No. 8471441L01

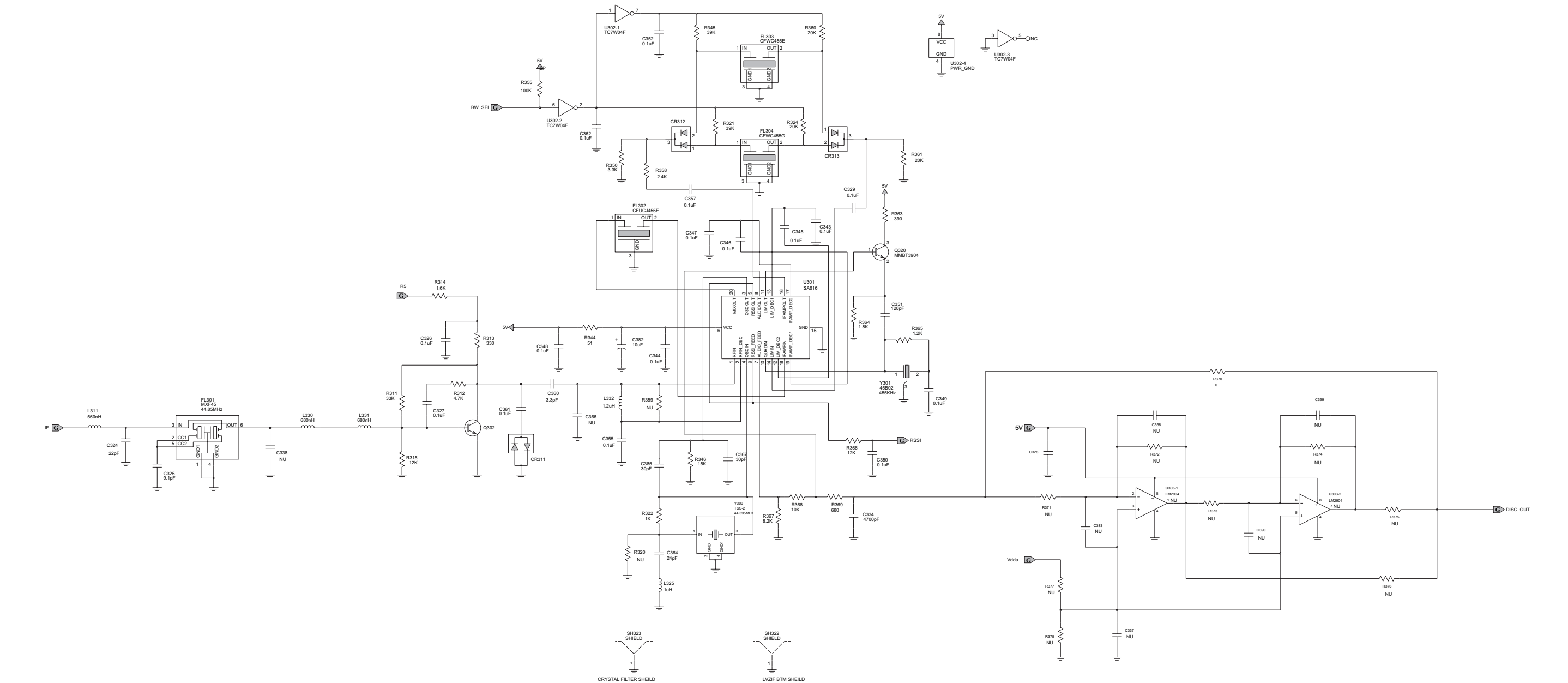


Figure 7-14: UHF Receiver Back End Schematic Diagram for PCB No. 8471441L01

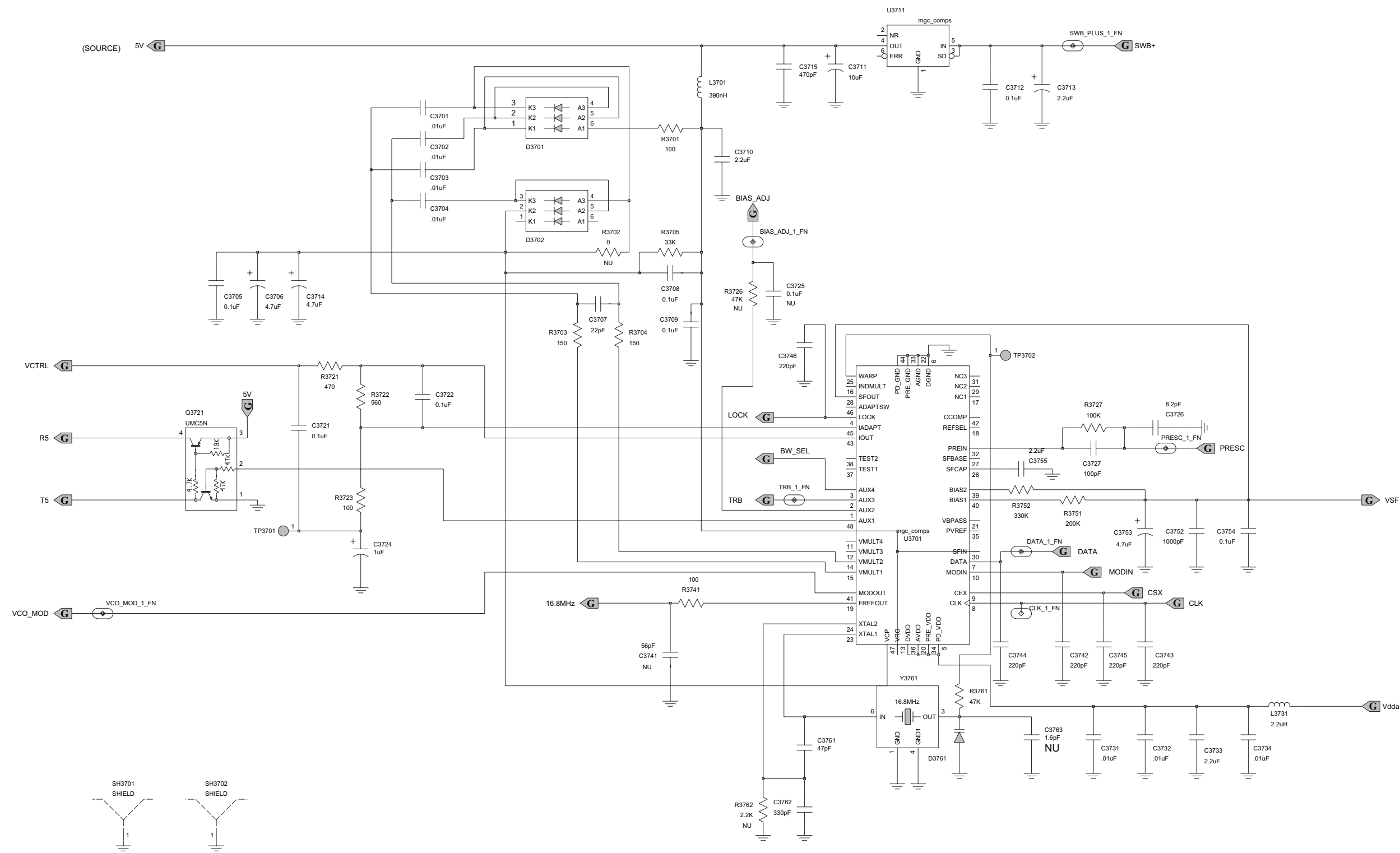


Figure 7-15: UHF Synthesizer Schematic Diagram for PCB No. 8471441L01

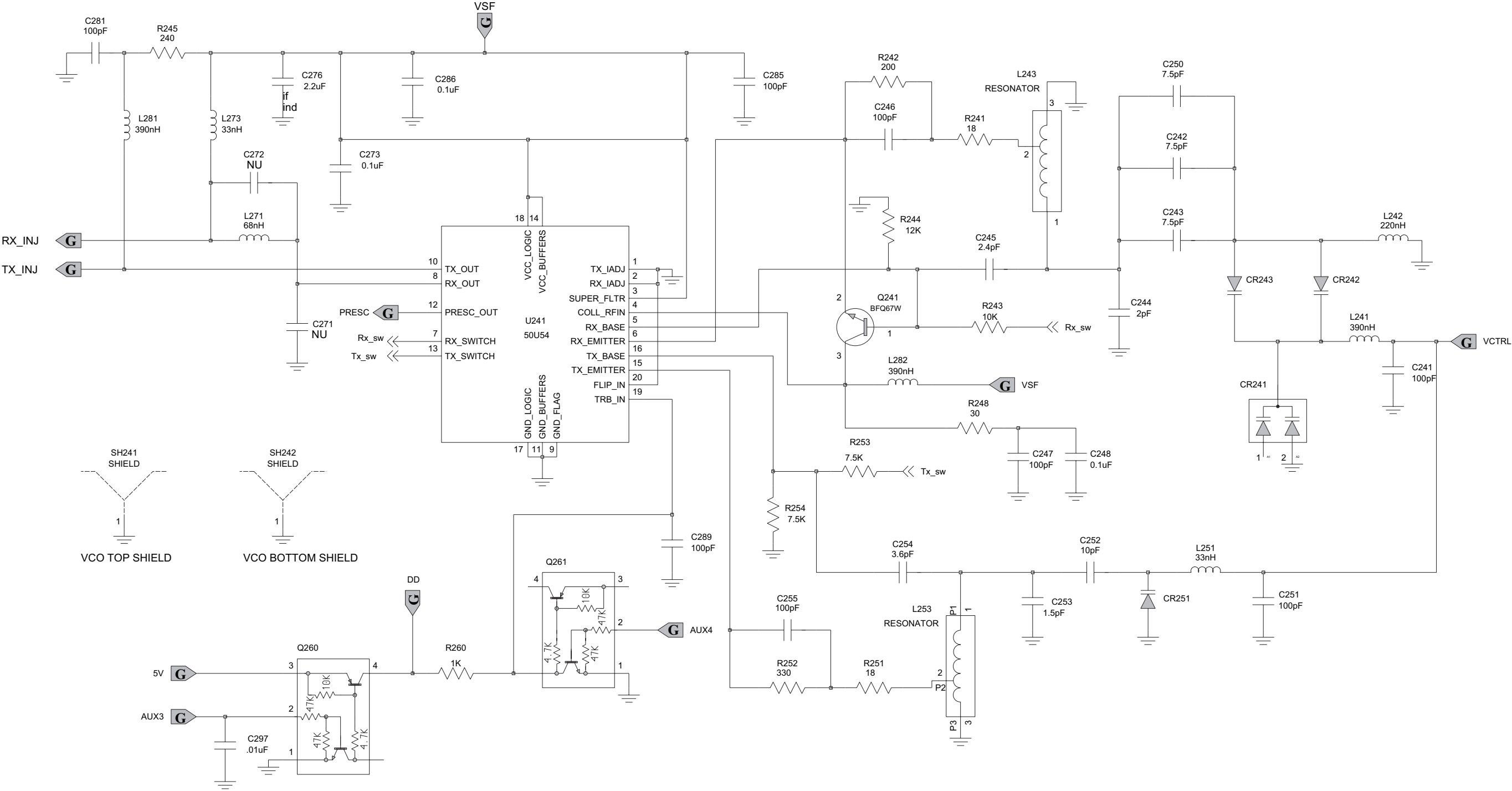
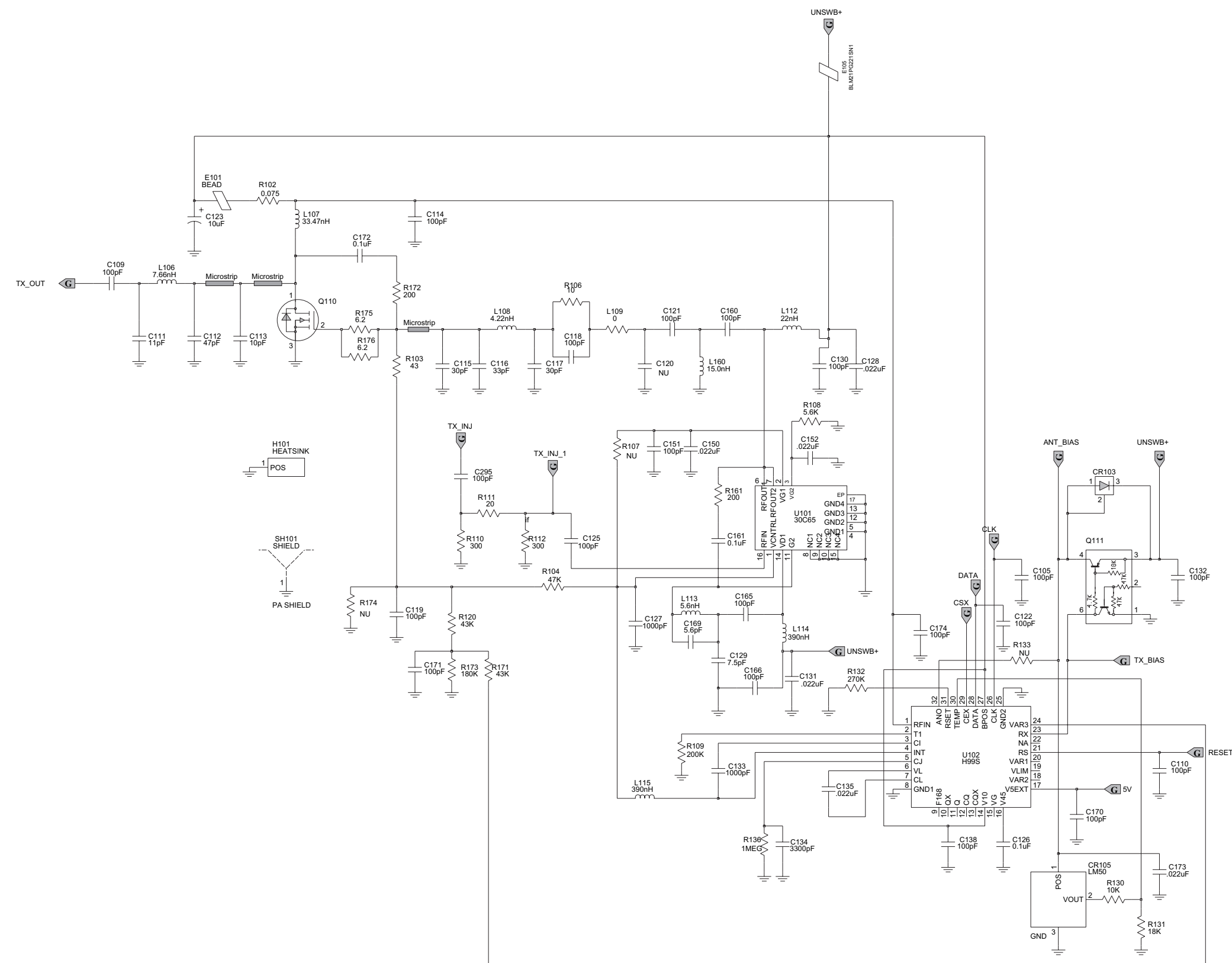


Figure 7-16: UHF Voltage Controlled Oscillator Schematic Diagram for PCB No. 8471441L01



UHF Band 1 Radio Parts List (PCB No. 8471441L01)

Circuit Ref	Motorola Part No.	Description
B501	8471441L01 0986237A02	PWB CONNECTOR (CONTACT BATTERY)
B503	3980502Z01	CONTACT, BACKUP B+
B504	3980501Z01	CONTACT, BACKUP B-
C101	2113944C45	CAP CER CHP 100.0PF 50V 5%
C102	2113944M16	CAP,FXD,8.2PF,.1PF+/-,50V-DC,0
C103	2113944M21	CAP,FXD,13PF,+2%,-2%,50V-DC,0
C104	2113944M15	CAP,FXD,7.5PF,.1PF+/-,50V-DC,0
C105	2113944A40	CAP CER CHP 100.0PF 50V 5%
C106	2113944C22	CAP CER CHP 4.7PF 50V +/- 0.25
C107	2113944C18	CAP CER CHP 3.3PF 50V +/- 0.25
C108	2113944A40	CAP CER CHP 100.0PF 50V 5%
C109	2113944C45	CAP CER CHP 100.0PF 50V 5%
C110	2113944A40	CAP CER CHP 100.0PF 50V 5%
C111	2113944C32	CAP CER CHP 15.0PF 50V 5%
C112	2115937H04	HIGH Q CHIP CAPACITOR, 47PF
C113	2115937H01	HIGH Q CHIP CAPACITOR, 10PF
C114	2113944A40	CAP CER CHP 100.0PF 50V 5%
C115	2113944A81	CAP,FXD,24PF,+5%,-5%,50V-DC,04
C116	2113944A81	CAP,FXD,24PF,+5%,-5%,50V-DC,04
C117	2113944A29	CAP CER CHP 22.0PF 50V 5%
C118	2113944A40	CAP CER CHP 100.0PF 50V 5%
C119	2113944A40	CAP CER CHP 100.0PF 50V 5%
C120	2113944A77	CAP,FXD,11PF,+5%,-5%,50V-DC,04
C121	2113944A40	CAP CER CHP 100.0PF 50V 5%

Circuit Ref	Motorola Part No.	Description
C122	2113944A40	CAP CER CHP 100.0PF 50V 5%
C123	2313960F04	CAP TANT 33 UF 10% 16V 6032-28
C125	2113944A40	CAP CER CHP 100.0PF 50V 5%
C126	2113946K02	CAP CER CHP 0.10UF 16V
C127	2113945A09	CAP CER CHP 1000PF 50V 10%
C128	2113945B04	CAP,FXD,.022UF,+10%,-10%,25V-D
C129	2113944A22	CAP CER CHP 7.5PF 50V +/- 0.5P
C130	2113944A40	CAP CER CHP 100.0PF 50V 5%
C131	2113945B04	CAP,FXD,.022UF,+10%,-10%,25V-D
C132	2113944A40	CAP CER CHP 100.0PF 50V 5%
C133	2113945A09	CAP CER CHP 1000PF 50V 10%
C134	2113945A12	CAP CER CHP 3300PF 50V 10%
C135	2113945B04	CAP,FXD,.022UF,+10%,-10%,25V-D
C138	2113944A40	CAP CER CHP 100.0PF 50V 5%
C150	2113945B04	CAP,FXD,.022UF,+10%,-10%,25V-D
C151	2113944A40	CAP CER CHP 100.0PF 50V 5%
C152	2113945B04	CAP,FXD,.022UF,+10%,-10%,25V-D
C160	2113944A40	CAP CER CHP 100.0PF 50V 5%
C161	2113946K02	CAP CER CHP 0.10UF 16V
C165	2113944A40	CAP CER CHP 100.0PF 50V 5%
C166	2113944A40	CAP CER CHP 100.0PF 50V 5%
C169	2113944A19	CAP CER CHP 5.6PF 50V +/- 0.5P
C170	2113944A40	CAP CER CHP 100.0PF 50V 5%
C171	2113944A40	CAP CER CHP 100.0PF 50V 5%
C172	2113944C45	CAP CER CHP 100.0PF 50V 5%
C173	2113945B04	CAP,FXD,.022UF,+10%,-10%,25V-D

Circuit Ref	Motorola Part No.	Description
C174	2113944A40	CAP CER CHP 100.0PF 50V 5%
C175	2113944C45	CAP CER CHP 100.0PF 50V 5%
C201	2113944A40	CAP CER CHP 100.0PF 50V 5%
C202	2113945A09	CAP CER CHP 1000PF 50V 10%
C203	2113946H01	CAP CER CHP 4.7UF 10V 10%
C204	2113946N03	CAP CER CHP 2.2UF 16V
C206	2113944C04	CAP CER CHP 330.0PF 50V 5%
C207	2113944A33	CAP CER CHP 47.0PF 50V 5%
C208	NOTPLACED	GCAM DUMMY PART NUMBER
C210	2113944A40	CAP CER CHP 100.0PF 50V 5%
C211	2113944A40	CAP CER CHP 100.0PF 50V 5%
C212	2113944A40	CAP CER CHP 100.0PF 50V 5%
C213	2113944A40	CAP CER CHP 100.0PF 50V 5%
C214	2113944A40	CAP CER CHP 100.0PF 50V 5%
C217	2113946N03	CAP CER CHP 2.2UF 16V
C218	2113946K02	CAP CER CHP 0.10UF 16V
C219	2113946L03	CAP CER CHP 0.22UF 16V
C220	2113944A40	CAP CER CHP 100.0PF 50V 5%
C223	2113946K02	CAP CER CHP 0.10UF 16V
C224	2113946K02	CAP CER CHP 0.10UF 16V
C228	2313960D05	CAP,FXD,4.7UF,+10%,-10%,16V-DC
C229	2113945A09	CAP CER CHP 1000PF 50V 10%
C230	2113944A40	CAP CER CHP 100.0PF 50V 5%
C231	2113946K02	CAP CER CHP 0.10UF 16V
C232	2113945D02	CAP CER CHP 47,000PF 25V 10%
C233	2313960A26	CAP,FXD,.1UF,+10%,-10%,35V-DC,
C234	2313960A55	CAP,FXD,.47UF,+10%,-10%,25V-DC
C235	2113946N03	CAP CER CHP 2.2UF 16V
C238	2113945L17	CAP,FXD,470PF,+5%,-5%,50V-DC,0

Circuit Ref	Motorola Part No.	Description
C241	2113944A40	CAP CER CHP 100.0PF 50V 5%
C242	2113944A22	CAP CER CHP 7.5PF 50V +/- 0.5P
C243	2113944A22	CAP CER CHP 7.5PF 50V +/- 0.5P
C244	2113944C13	CAP CER CHP 2.0PF 50V +/- 0.25
C245	2113944A10	CAP CER CHP 2.4PF 50V +/- 0.25
C246	2113944A40	CAP CER CHP 100.0PF 50V 5%
C247	2113944A40	CAP CER CHP 100.0PF 50V 5%
C248	2113946K02	CAP CER CHP 0.10UF 16V
C250	2113944A22	CAP CER CHP 7.5PF 50V +/- 0.5P
C251	2113944A40	CAP CER CHP 100.0PF 50V 5%
C252	2113944A25	CAP CER CHP 10.0PF 50V +/- 0.5
C253	2113944C12	CAP CER CHP 1.8PF 50V +/- 0.25
C254	2113944A14	CAP CER CHP 3.6PF 50V +/- 0.25
C255	2113944A40	CAP CER CHP 100.0PF 50V 5%
C257	2113944A40	CAP CER CHP 100.0PF 50V 5%
C258	2113945B02	CAP CER CHP 10,000PF 25V 10%
C259	2113945B02	CAP CER CHP 10,000PF 25V 10%
C260	2113944A40	CAP CER CHP 100.0PF 50V 5%
C263	2113944A62	CAP,FXD,.75PF,.25PF+/-,50V-DC,
C264	2113944A40	CAP CER CHP 100.0PF 50V 5%
C265	NOTPLACED	GCAM DUMMY PART NUMBER
C271	NOTPLACED	GCAM DUMMY PART NUMBER
C272	NOTPLACED	GCAM DUMMY PART NUMBER
C273	2113946K02	CAP CER CHP 0.10UF 16V
C276	2113946N03	CAP CER CHP 2.2UF 16V
C277	2113944A40	CAP CER CHP 100.0PF 50V 5%
C278	2313960D07	CAP,FXD,10,+10,-10,16,SM,-55M

Circuit Ref	Motorola Part No.	Description
C279	2113946N03	CAP CER CHP 2.2UF 16V
C281	2113944A40	CAP CER CHP 100.0PF 50V 5%
C285	2113944A40	CAP CER CHP 100.0PF 50V 5%
C286	2113946K02	CAP CER CHP 0.10UF 16V
C289	2113944A40	CAP CER CHP 100.0PF 50V 5%
C291	2313960M51	CAP,FXD,10UF,+10%,-10%,6.3V-DC
C292	2113946K02	CAP CER CHP 0.10UF 16V
C293	2113945G98	CAP,FXD,.47UF,+10%,-10%,50V-DC
C294	2113944A40	CAP CER CHP 100.0PF 50V 5%
C295	2113944A40	CAP CER CHP 100.0PF 50V 5%
C296	2113946K02	CAP CER CHP 0.10UF 16V
C297	2113945B02	CAP CER CHP 10,000PF 25V 10%
C298	2113946K02	CAP CER CHP 0.10UF 16V
C301	2113944A14	CAP CER CHP 3.6PF 50V +/-0.25
C302	2113944A25	CAP CER CHP 10.0PF 50V +/-0.5
C303	2113944C20	CAP CER CHP 3.9PF 50V +/-0.25
C304	2113944A25	CAP CER CHP 10.0PF 50V +/-0.5
C305	2113944A80	CAP,FXD,20PF,+5%,-5%,50V-DC,04
C306	NOTPLACED	GCAM DUMMY PART NUMBER
C307	2113944A40	CAP CER CHP 100.0PF 50V 5%
C308	2113944A40	CAP CER CHP 100.0PF 50V 5%
C309	2113944A40	CAP CER CHP 100.0PF 50V 5%
C310	2113944A40	CAP CER CHP 100.0PF 50V 5%
C311	NOTPLACED	GCAM DUMMY PART NUMBER
C312	2113944A24	CAP CER CHP 9.1PF 50V +/-0.5P
C313	2113944A25	CAP CER CHP 10.0PF 50V +/-0.5
C314	2113946K02	CAP CER CHP 0.10UF 16V
C315	2113944A40	CAP CER CHP 100.0PF 50V 5%

Circuit Ref	Motorola Part No.	Description
C316	2113944C20	CAP CER CHP 3.9PF 50V +/-0.25
C317	2113944A24	CAP CER CHP 9.1PF 50V +/-0.5P
C318	2113944A22	CAP CER CHP 7.5PF 50V +/-0.5P
C319	2113944A11	CAP CER CHP 2.7PF 50V +/-0.25
C320	2113944A79	CAP,FXD,16PF,+5%,-5%,50V-DC,04
C321	2113944A40	CAP CER CHP 100.0PF 50V 5%
C322	2113944A38	CAP CER CHP 82.0PF 50V 5%
C324	2113944A29	CAP CER CHP 22.0PF 50V 5%
C325	2115153H26	CAP, CERAMIC, COG
C326	2113946K02	CAP CER CHP 0.10UF 16V
C327	2113946K02	CAP CER CHP 0.10UF 16V
C328	2113946K02	CAP CER CHP 0.10UF 16V
C329	2113946K02	CAP CER CHP 0.10UF 16V
C334	2113945A13	CAP CER CHP 4700PF 50V 10%
C337	NOTPLACED	GCAM DUMMY PART NUMBER
C338	NOTPLACED	GCAM DUMMY PART NUMBER
C343	2113946K02	CAP CER CHP 0.10UF 16V
C344	2113945D04	CAP CER CHP 100,000PF 25V 10%
C345	2113946K02	CAP CER CHP 0.10UF 16V
C346	2113946K02	CAP CER CHP 0.10UF 16V
C347	2113946K02	CAP CER CHP 0.10UF 16V
C348	2113946K02	CAP CER CHP 0.10UF 16V
C349	2113945D04	CAP CER CHP 100,000PF 25V 10%
C350	2113946K02	CAP CER CHP 0.10UF 16V
C351	2113944A41	CAP CER CHP 120.0PF 50V 5%
C352	2113946K02	CAP CER CHP 0.10UF 16V
C355	2113946K02	CAP CER CHP 0.10UF 16V
C357	2113946K02	CAP CER CHP 0.10UF 16V
C358	NOTPLACED	GCAM DUMMY PART NUMBER
C359	NOTPLACED	GCAM DUMMY PART NUMBER
C360	2113944A13	CAP CER CHP 3.3PF 50V +/-0.25
C361	2113946K02	CAP CER CHP 0.10UF 16V
C362	2113946K02	CAP CER CHP 0.10UF 16V

Circuit Ref	Motorola Part No.	Description
C364	2113944A81	CAP,FXD,24PF,+5%,-5%,50V-DC,04
C366	NOTPLACED	GCAM DUMMY PART NUMBER
C367	2113944A82	CAP,FXD,30PF,+5%,-5%,50V-DC,04
C370	2113944A17	CAP CER CHP 4.7PF 50V +/-0.25
C371	NOTPLACED	GCAM DUMMY PART NUMBER
C372	2113944A40	CAP CER CHP 100.0PF 50V 5%
C373	NOTPLACED	GCAM DUMMY PART NUMBER
C374	2113944A40	CAP CER CHP 100.0PF 50V 5%
C375	2113944A40	CAP CER CHP 100.0PF 50V 5%
C378	NOTPLACED	GCAM DUMMY PART NUMBER
C380	2113945B02	CAP CER CHP 10,000PF 25V 10%
C381	NOTPLACED	GCAM DUMMY PART NUMBER
C382	2313960B57	CAP,FXD,10UF,+10%,-10%,6.3V-DC
C383	NOTPLACED	GCAM DUMMY PART NUMBER
C385	2113944A82	CAP,FXD,30PF,+5%,-5%,50V-DC,04
C386	2113944A40	CAP CER CHP 100.0PF 50V 5%
C390	NOTPLACED	GCAM DUMMY PART NUMBER
C391	2113944A81	CAP,FXD,24PF,+5%,-5%,50V-DC,04
C502	2313960A55	CAP,FXD,.47UF,+10%,-10%,25V-DC
C503	2113944A84	CAP,FXD,43PF,+5%,-5%,50V-DC,04
C505	2113944A40	CAP CER CHP 100.0PF 50V 5%
C511	2113944A40	CAP CER CHP 100.0PF 50V 5%
C512	2113944A40	CAP CER CHP 100.0PF 50V 5%
C513	2113944A40	CAP CER CHP 100.0PF 50V 5%
C514	2113944A40	CAP CER CHP 100.0PF 50V 5%

Circuit Ref	Motorola Part No.	Description
C520	2113945B02	CAP CER CHP 10,000PF 25V 10%
C521	2113945B02	CAP CER CHP 10,000PF 25V 10%
C522	2113945B02	CAP CER CHP 10,000PF 25V 10%
C523	2113945B02	CAP CER CHP 10,000PF 25V 10%
C525	2113944A40	CAP CER CHP 100.0PF 50V 5%
C526	2113944A40	CAP CER CHP 100.0PF 50V 5%
C527	2113944A40	CAP CER CHP 100.0PF 50V 5%
C528	2113944A40	CAP CER CHP 100.0PF 50V 5%
C529	2113944A40	CAP CER CHP 100.0PF 50V 5%
C530	2113944A40	CAP CER CHP 100.0PF 50V 5%
C531	2113944A40	CAP CER CHP 100.0PF 50V 5%
C532	2113944A40	CAP CER CHP 100.0PF 50V 5%
C533	2113944A40	CAP CER CHP 100.0PF 50V 5%
C534	2113944A40	CAP CER CHP 100.0PF 50V 5%
C535	2113944A40	CAP CER CHP 100.0PF 50V 5%
C536	2113944A40	CAP CER CHP 100.0PF 50V 5%
C537	2113944A40	CAP CER CHP 100.0PF 50V 5%
C538	2113944A40	CAP CER CHP 100.0PF 50V 5%
C539	NOTPLACED	GCAM DUMMY PART NUMBER
C540	NOTPLACED	GCAM DUMMY PART NUMBER
C541	NOTPLACED	GCAM DUMMY PART NUMBER
C542	NOTPLACED	GCAM DUMMY PART NUMBER
C543	NOTPLACED	GCAM DUMMY PART NUMBER
C544	2113944A40	CAP CER CHP 100.0PF 50V 5%
C545	2113944A40	CAP CER CHP 100.0PF 50V 5%

Circuit Ref	Motorola Part No.	Description
C546	2113944A40	CAP CER CHP 100.0PF 50V 5%
C547	2113944A40	CAP CER CHP 100.0PF 50V 5%
C548	NOTPLACED	GCAM DUMMY PART NUMBER
C549	2113944A40	CAP CER CHP 100.0PF 50V 5%
C550	2113944A40	CAP CER CHP 100.0PF 50V 5%
C551	2113944A40	CAP CER CHP 100.0PF 50V 5%
C552	2113944A84	CAP,FXD,43PF,+5%,-5%,50V-DC,04
C553	2113944A84	CAP,FXD,43PF,+5%,-5%,50V-DC,04
C555	2113944A40	CAP CER CHP 100.0PF 50V 5%
C597	2113944A84	CAP,FXD,43PF,+5%,-5%,50V-DC,04
C598	2113944A17	CAP CER CHP 4.7PF 50V +/- 0.25
C599	2113944A15	CAP CER CHP 3.9PF 50V +/- 0.25
C600	2113944A81	CAP,FXD,24PF,+5%,-5%,50V-DC,04
C601	2113944A40	CAP CER CHP 100.0PF 50V 5%
C602	2113944A17	CAP CER CHP 4.7PF 50V +/- 0.25
CR101	4880973Z02	PIN DIODE
CR102	4815257H01	SURFACE MOUNT PIN DIODES
CR103	4815257H01	SURFACE MOUNT PIN DIODES
CR105	5115022H01	IC TEMPERATURE SENSOR
CR201	4815011H01	DIODE TRIPLE
CR203	4815072H01	DIODE VARACTOR
CR241	4885094Y01	DIODE VARACTOR ISV228 W18
CR242	4815279H01	BBY5503WE6327 FROM INFINEON
CR243	4815279H01	BBY5503WE6327 FROM INFINEON
CR251	4815322H01	VHF VARIABLE CAPACITANCE DIODE
CR301	4815279H01	BBY5503WE6327 FROM INFINEON
CR302	4815279H01	BBY5503WE6327 FROM INFINEON

Circuit Ref	Motorola Part No.	Description
CR303	4815048H01	SOT MMBD353 DIODE DUAL SCHT
CR304	4815279H01	BBY5503WE6327 FROM INFINEON
CR305	4815279H01	BBY5503WE6327 FROM INFINEON
CR306	4815923H02	SCHOTTKY DIODE-NEW LE ADFREE
CR311	4813974A19	DIODE ARRAY,MXR,SM,SOT-323,7V,
CR312	4815047H01	DIODE,SWG,DAN235E FTL,35V
CR313	4815047H01	DIODE,SWG,DAN235E FTL,35V
CR501	4815155H01	RECTIFIER
CR503	4805729G49	DIODE RED/YEL
D101	4813978C06	DIODE ARRAY,SIGNAL/ SWG,SOT-23
E101	2415954H02	INDUCTOR BEAD CHIP EPP WITH EP
E102	7686949J14	FLTR,FERRITE BEAD,2A,SM
E103	7686949J08	FLTR,FERR,1A,SM,0603
E104	7686949J08	FLTR,FERR,1A,SM,0603
E105	7686949J14	FLTR,FERRITE BEAD,2A,SM
F501	6515076H01	FUSE CHIP SMT TR/1608FF 3A
FL201	4805875Z04	CRYSTAL 16.8 MHZ
FL301	9180022M11	XTAL FILTER 44.85MHZ
FL302	9180468V04	SMD455KHZ 4 ELEMENT CE R FLTR
FL303	9115811H03	SMD455KHZ 6 ELEMENT
FL304	9115811H01	SMD455KHZ 6 ELEMENT
H101	2680499Z02	HEAT SPREADER
J200	0915064H03	CONNECTOR, ZIF (40 PINS)
L101	2460591C40	COIL AIR WOUND INDUC 17.02
L102	2460591C40	COIL AIR WOUND INDUC 17.02
L104	2479990B02	AIR WOUND COIL/GREEN COLOR 19.
L105	2414032B22	IDCTR,WW,390NH,10%,620 MA,1.12O
L106	2479990A02	AIR WND COIL/GREEN COLOR7.66NH
L107	2479990G01	AIR WOUND COIL/GREEN COLOR 33.
L108	2479990A01	AIR WOUND COIL/GREEN COLOR 4.2
L109	2479990B01	AIR WOUND COIL/GREEN COLOR 11.

Circuit Ref	Motorola Part No.	Description
L112	2414032B45	IDCTR,WW,22NH,5%,1A,.12 OHM,CER
L113	2414017N09	IDCTR,CHIP,5.6NH,600MA,.2 OHM,C
L114	2414032B45	IDCTR,WW,22NH,5%,1A,.12 OHM,CER
L115	2414032B22	IDCTR,WW,390NH,10%,620 MA,1.12O
L160	2414017N14	IDCTR,CHIP,15NH,5%,600M A,.4OHM
L201	2414017Q20	IDCTR,FXD,2.2UH,20%,30M A,.65OH
L202	2414017Q20	IDCTR,FXD,2.2UH,20%,30M A,.65OH
L203	2414017Q20	IDCTR,FXD,2.2UH,20%,30M A,.65OH
L232	2414032L25	IDCTR,WW,12UH,5%,150MA, 3.8OHM,
L241	2414032F41	IDCTR,WW,390NH,10%,200 MA,1.5OH
L242	2414032F38	IDCTR,WW,220NH,5%,400M A,.7OHM,
L243	2485776Z01	COIL TEFLON RESONATOR (KAPTON)
L251	2414032F28	IDCTR,WW,33NH,5%,500MA, .27OHM,
L253	2460593C02	COIL MULT LAYERED TAP TEF RESN
L261	2414032F29	IDCTR,WW,39NH,5%,500MA, .29OHM,
L271	2414032F32	IDCTR,WW,68NH,5%,500MA, .38OHM,
L273	2414032F28	IDCTR,WW,33NH,5%,500MA, .27OHM,
L281	2414032F41	IDCTR,WW,390NH,10%,200 MA,1.5OH
L282	2414032F41	IDCTR,WW,390NH,10%,200 MA,1.5OH
L301	2479990C01	AIR WND COIL/GREEN COLOR13.9NH
L302	2479990C01	AIR WND COIL/GREEN COLOR13.9NH
L303	2414032F26	IDCTR,WW,22NH,5%,500MA, .22OHM,
L304	2414032F37	IDCTR,WW,180NH,5%,400M A,.64OHM
L305	2414032F26	IDCTR,WW,22NH,5%,500MA, .22OHM,
L306	2479990C01	AIR WND COIL/GREEN COLOR13.9NH

Circuit Ref	Motorola Part No.	Description
L307	2479990C01	AIR WND COIL/GREEN COLOR13.9NH
L309	2479990C02	AIR WOUND COIL/GREEN COLOR 16.
L310	2414032F36	IDCTR,WW,150NH,5%,400M A,.56OHM
L311	2414017K32	IDCTR,CHIP,560NH,5%,50M A,5OHM,
L321	2414032F37	IDCTR,WW,180NH,5%,400M A,.64OHM
L325	2414032B68	IDCTR,WW,1UH,5%,460MA,1 .75OHM,
L330	0613958J74	CER CHIP RES 0.0 OHM JMP 0805
L331	2414017K33	IDCTR,CHIP,680NH,5%,50M A,5.5OH
L332	2414015A25	IDCTR,CHIP,1.2UH,2%,440M A,2OHM
L505	2414017Q42	IDCTR,FXD,390NH,10%,200 MA,.65O
P100	3905643V01	CONTACT ANT GRD
PB501	4070354A01	LIGHT TOUCH SWITCH-SMD
PB502	4070354A01	LIGHT TOUCH SWITCH-SMD
PB504	4070354A01	LIGHT TOUCH SWITCH-SMD
PB505	4070354A01	LIGHT TOUCH SWITCH-SMD
Q110	4813976A03	450MHZ 8W 7.5V PLD-1.5 T&R
Q111	4815055H01	TSTR DUAL NPN/PNP UMH 5
Q210	4815055H01	TSTR DUAL NPN/PNP UMH 5
Q241	4805218N63	RF TRANS SOT 323 Bfq67W
Q260	4815055H01	TSTR DUAL NPN/PNP UMH 5
Q261	4815055H01	TSTR DUAL NPN/PNP UMH 5
Q301	4816531H01	NPN SILICON BIPOLAR TRANSISTOR
Q302	4802197J95	RF TRANSISTOR PBR941
Q310	4816531H01	NPN SILICON BIPOLAR TRANSISTOR
Q320	4813973M07	XSTR,BIP GP SS,NPN,TO-236,
Q502	4815154H01	DUAL TRANS NPN
Q505	4813973M07	XSTR,BIP GP SS,NPN,TO-236,

Circuit Ref	Motorola Part No.	Description
R101	0613952H58	CER CHIP RES 240 OHM 5 0603
R102	0615043C01	POWER METAL STRIP RESISTORS
R103	0613952Q40	CER CHIP RES 43.0 OHM 5 0402
R104	0613952R17	CER CHIP RES 47K OHM 5% 0402
R106	0613952Q25	CER CHIP RES 10.0 OHM 5 0402
R107	NOTPLACED	GCAM DUMMY PART NUMBER
R108	0613952Q91	CER CHIP RES 5600 OHM 5 0402
R109	0613952R32	CER CHIP RES 200K OHM 5 0402
R110	0613952Q60	CER CHIP RES 300 OHM 5 0402
R111	0613952Q32	CER CHIP RES 20.0 OHM 5 0402
R112	0613952Q60	CER CHIP RES 300 OHM 5 0402
R120	0613952R16	CER CHIP RES 43K OHM 5 0402
R130	0613952R01	CER CHIP RES 10K OHM 5% 0402
R131	0613952R07	CER CHIP RES 18K OHM 5% 0402
R132	0613952R35	CER CHIP RES 270K OHM 5% 0402
R133	NOTPLACED	GCAM DUMMY PART NUMBER
R136	NOTPLACED	GCAM DUMMY PART NUMBER
R161	0613952Q56	CER CHIP RES 200 OHM 5 0402
R170	0613952H58	CER CHIP RES 240 OHM 5 0603
R171	0613952R16	CER CHIP RES 43K OHM 5 0402
R172	0613952H49	CER CHIP RES 100 OHM 5% 0603
R173	0613952R31	CER CHIP RES 180K OHM 5% 0402
R174	0613952R17	CER CHIP RES 47K OHM 5% 0402
R175	0613952H12	CER CHIP RES 3.0 OHM 5 0603
R176	0613952H12	CER CHIP RES 3.0 OHM 5 0603

Circuit Ref	Motorola Part No.	Description
R201	0613952R23	CER CHIP RES 82K OHM 5% 0402
R202	0613952R25	CER CHIP RES 100K OHM 5% 0402
R204	0613952R17	CER CHIP RES 47K OHM 5% 0402
R231	0613952Q51	CER CHIP RES 120 OHM 5 0402
R232	0613952Q68	CER CHIP RES 620 OHM 5 0402
R233	0613952Q67	CER CHIP RES 560 OHM 5 0402
R241	0613952Q31	CER CHIP RES 18.0 OHM 5 0402
R242	0613952Q56	CER CHIP RES 200 OHM 5 0402
R243	0613952R01	CER CHIP RES 10K OHM 5% 0402
R244	0613952R03	CER CHIP RES 12K OHM 5% 0402
R245	0613952Q58	CER CHIP RES 240 OHM 5 0402
R248	0613952Q36	CER CHIP RES 30.0 OHM 5 0402
R251	0613952Q31	CER CHIP RES 18.0 OHM 5 0402
R252	0613952Q61	CER CHIP RES 330 OHM 5 0402
R253	0613952Q94	CER CHIP RES 7500 OHM 5 0402
R254	0613952Q94	CER CHIP RES 7500 OHM 5 0402
R255	0613952Q88	CER CHIP RES 4300 OHM 5 0402
R256	0613952Q36	CER CHIP RES 30.0 OHM 5 0402
R260	0613952Q73	CER CHIP RES 1000 OHM 5 0402
R281	NOTPLACED	GCAM DUMMY PART NUMBER
R301	0613952R25	CER CHIP RES 100K OHM 5% 0402
R302	0613952R25	CER CHIP RES 100K OHM 5% 0402
R303	0613952Q80	CER CHIP RES 2000 OHM 5 0402
R304	0613952R03	CER CHIP RES 12K OHM 5% 0402
R305	0613952Q66	CER CHIP RES 510 OHM 5 0402

Circuit Ref	Motorola Part No.	Description
R306	0613952R25	CER CHIP RES 100K OHM 5% 0402
R307	0613952R25	CER CHIP RES 100K OHM 5% 0402
R308	0613952Q42	CER CHIP RES 51.0 OHM 5 0402
R309	0613952R66	CER CHIP RES 0.0 +/-0.050 OHM
R310	NOTPLACED	GCAM DUMMY PART NUMBER
R311	0613952R13	CER CHIP RES 33K OHM 5% 0402
R312	0613952Q89	CER CHIP RES 4700 OHM 5 0402
R313	0613952Q61	CER CHIP RES 330 OHM 5 0402
R314	0613952Q78	CER CHIP RES 1600 OHM 5 0402
R315	0613952R03	CER CHIP RES 12K OHM 5% 0402
R320	NOTPLACED	GCAM DUMMY PART NUMBER
R321	0613952R15	CER CHIP RES 39K OHM 5% 0402
R322	0613952Q73	CER CHIP RES 1000 OHM 5 0402
R324	0613952R08	CER CHIP RES 20K OHM 5 0402
R328	0613952R66	CER CHIP RES 0.0 +/-0.050 OHM
R329	0613952R66	CER CHIP RES 0.0 +/-0.050 OHM
R330	0613952R01	CER CHIP RES 10K OHM 5% 0402
R331	0613952Q56	CER CHIP RES 200 OHM 5 0402
R332	0613952R03	CER CHIP RES 12K OHM 5% 0402
R333	NOTPLACED	GCAM DUMMY PART NUMBER
R339	0613952Q88	CER CHIP RES 4300 OHM 5 0402
R340	0613952Q94	CER CHIP RES 7500 OHM 5 0402
R342	0613952R25	CER CHIP RES 100K OHM 5% 0402
R344	0613952Q42	CER CHIP RES 51.0 OHM 5 0402
R345	0613952R15	CER CHIP RES 39K OHM 5% 0402

Circuit Ref	Motorola Part No.	Description
R346	0613952R05	CER CHIP RES 15K OHM 5% 0402
R348	0613952Q86	CER CHIP RES 3600 OHM 5 0402
R349	0613958J74	CER CHIP RES 0.0 OHM JMP 0805
R350	0613952Q85	CER CHIP RES 3300 OHM 5 0402
R355	0613952R25	CER CHIP RES 100K OHM 5% 0402
R358	0613952Q82	CER CHIP RES 2400 OHM 5 0402
R359	NOTPLACED	GCAM DUMMY PART NUMBER
R360	0613952R08	CER CHIP RES 20K OHM 5 0402
R361	0613952R08	CER CHIP RES 20K OHM 5 0402
R363	0613952Q63	CER CHIP RES 390 OHM 5 0402
R364	0613952Q79	CER CHIP RES 1800 OHM 5 0402
R365	0613952Q75	CER CHIP RES 1200 OHM 5 0402
R366	0613952R03	CER CHIP RES 12K OHM 5% 0402
R367	0613952N09	CER CHIP RES 12.1K OHM 1 0402
R368	0613952N01	CER CHIP RES 10.0K OHM 1 0402
R369	0613952Q69	CER CHIP RES 680 OHM 5 0402
R370	0613952R66	CER CHIP RES 0.0 +/-0.050 OHM
R371	NOTPLACED	GCAM DUMMY PART NUMBER
R372	NOTPLACED	GCAM DUMMY PART NUMBER
R373	NOTPLACED	GCAM DUMMY PART NUMBER
R374	NOTPLACED	GCAM DUMMY PART NUMBER
R375	NOTPLACED	GCAM DUMMY PART NUMBER
R376	NOTPLACED	GCAM DUMMY PART NUMBER
R377	NOTPLACED	GCAM DUMMY PART NUMBER
R378	NOTPLACED	GCAM DUMMY PART NUMBER

Circuit Ref	Motorola Part No.	Description
R501	0613952Q69	CER CHIP RES 680 OHM 5 0402
R502	0613952Q55	CER CHIP RES 180 OHM 5 0402
R505	0613952R01	CER CHIP RES 10K OHM 5% 0402
R506	0613952R17	CER CHIP RES 47K OHM 5% 0402
R507	0613952R66	CER CHIP RES 0.0 +/-0.050 OHM
R509	0613952R66	CER CHIP RES 0.0 +/-0.050 OHM
R510	0613952R66	CER CHIP RES 0.0 +/-0.050 OHM
R511	NOTPLACED	GCAM DUMMY PART NUMBER
S501	4080710Z21	SWITCH, FREQUENCY
S502	1880619Z06	POTENTIOMETER, VOLUME
SH100	2680507Z02	SHIELD, HARMONIC FILTER
SH101	2680510Z02	SHIELD, PA
SH201	2680511Z02	SHIELD, SYNTHESIZER
SH202	2680511Z02	SHIELD, SYNTHESIZER
SH241	2604120G02	AOBA VCO SHIELD
SH242	2680514Z02	SHIELD, VCO BOTTOM/ LVZIF
SH301	2686583Z02	SHIELD, RECEIVER FRONT END TOP
SH302	2680555Z02	SHIELD, RECEIVER F/END BOTTOM
SH303	2680509Z02	SHIELD, MIXER
SH304	2680624Z02	SHIELD, MIXER DIODE
SH322	2686528Z02	SHIELD, IF SECTION
SH323	2615924H01	SHIELD, CRYSTAL FILTER
T301	2515121H01	BALUN, TRANSFORMER W18 COMP
T302	2515121H01	BALUN, TRANSFORMER W18 COMP
U101	5115678H01	VHF/UHF/800/900 MHZ LDMOS DRIV
U102	5185765B26	IC PWR CTRL IN MOS20
U201	5185177Y01	IC TESTED AT25016 48 PIN W18
U210	5115266H01	INVERTER TC7ST04FU SS0P5-P-A
U211	5115266H01	INVERTER TC7ST04FU SS0P5-P-A
U241	5105750U56	IC PKG DIE VCO BUFFER
U247	5115026H01	MAX SUPPLY VOL 16V
U248	5115019H01	3.3V REGULATOR IN SOT23-5 PKG

Circuit Ref	Motorola Part No.	Description
U301	5115281H01	FM IF IC SA616 FROM PHIL-IPS
U302	5115070H01	IC 3-INV LMOS TC7W04FU
U303	NOTPLACED	GCAM DUMMY PART NUMBER
VR439	4813977M21	DIODE,ZE N,MBZ5242,SM,SOT-23,12
VR440	4815038H01	ZENER DIODE-6.8V
VR441	4815038H01	ZENER DIODE-6.8V
VR443	4815038H01	ZENER DIODE-6.8V
VR444	4815038H01	ZENER DIODE-6.8V
VR501	4813977M14	DIODE,ZE N,MBZ5235,SM,SOT-23,6.
VR506	4815038H01	ZENER DIODE-6.8V
Y300	4802245J84	XTAL 44.395MHZ, 3RD OT, SMD
Y301	9186145B02	CER.DISCR. CDBCA455CX36-TC
	1485777Z01	INSULATOR (KAPTON)
	2460593C01	COIL MULT LAYERED TAP TEF RESN
	2880658Z08	SMA CONNECTOR

* Motorola Depot Servicing only

** Not Servicable

8.1 UHF Band 2, Circuit Board/Schematic Diagrams and Parts List

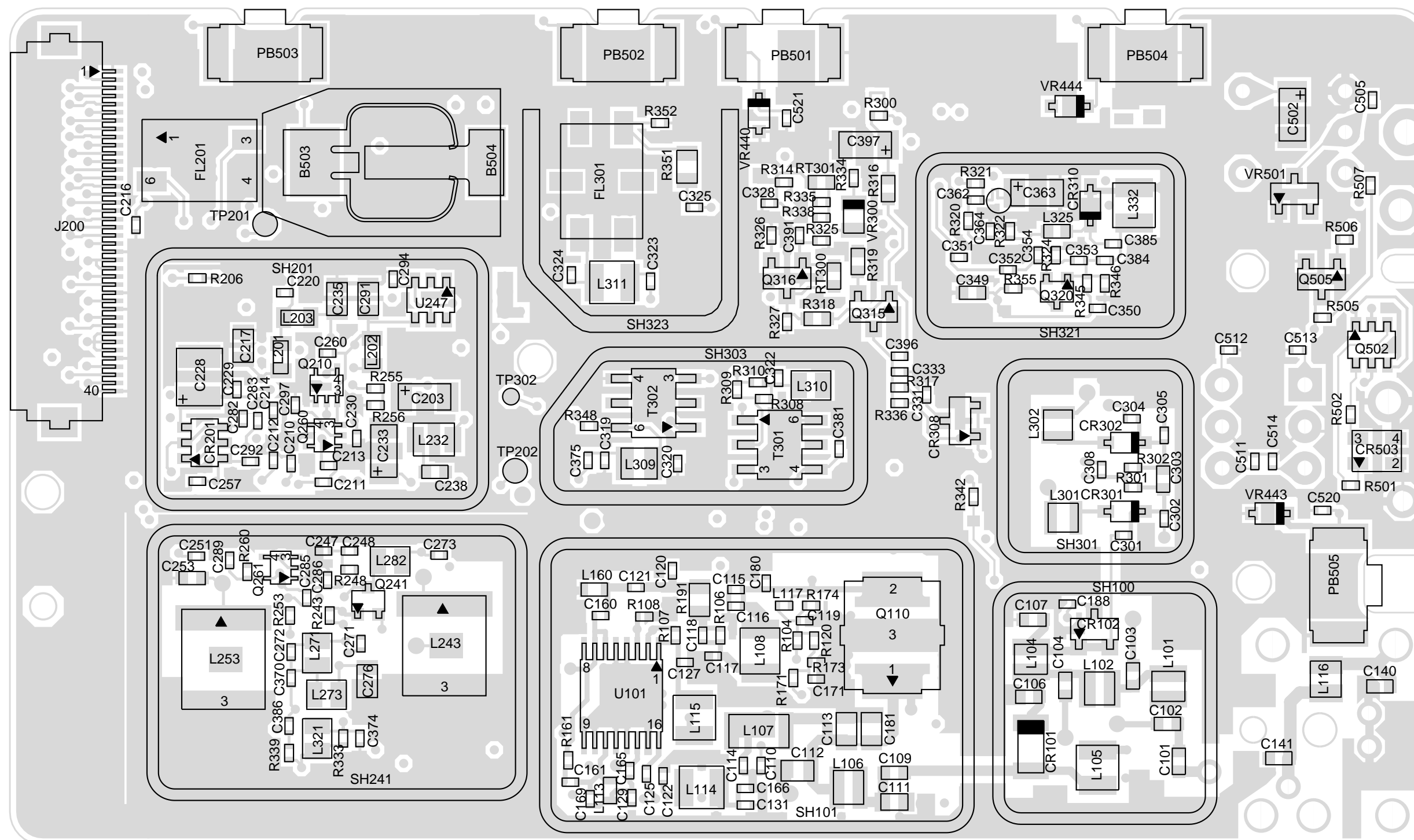


Figure 8-1: UHF Band 2 (450-527MHz) Main Board Top Side PCB No. 8485641Z02

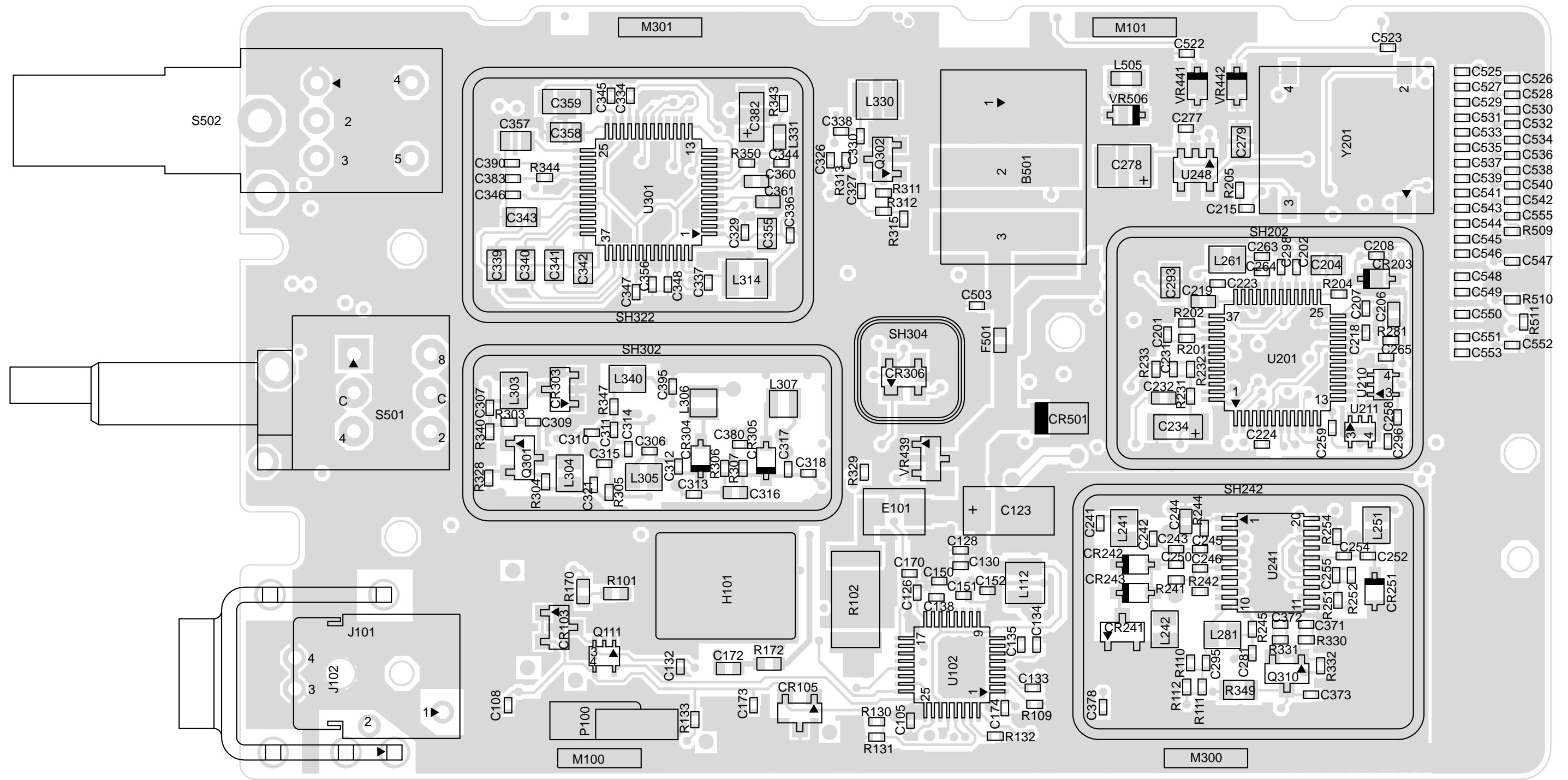


Figure 8-2: UHF Band 2 (450-527MHz) Main Board Bottom Side PCB No. 8485641Z02

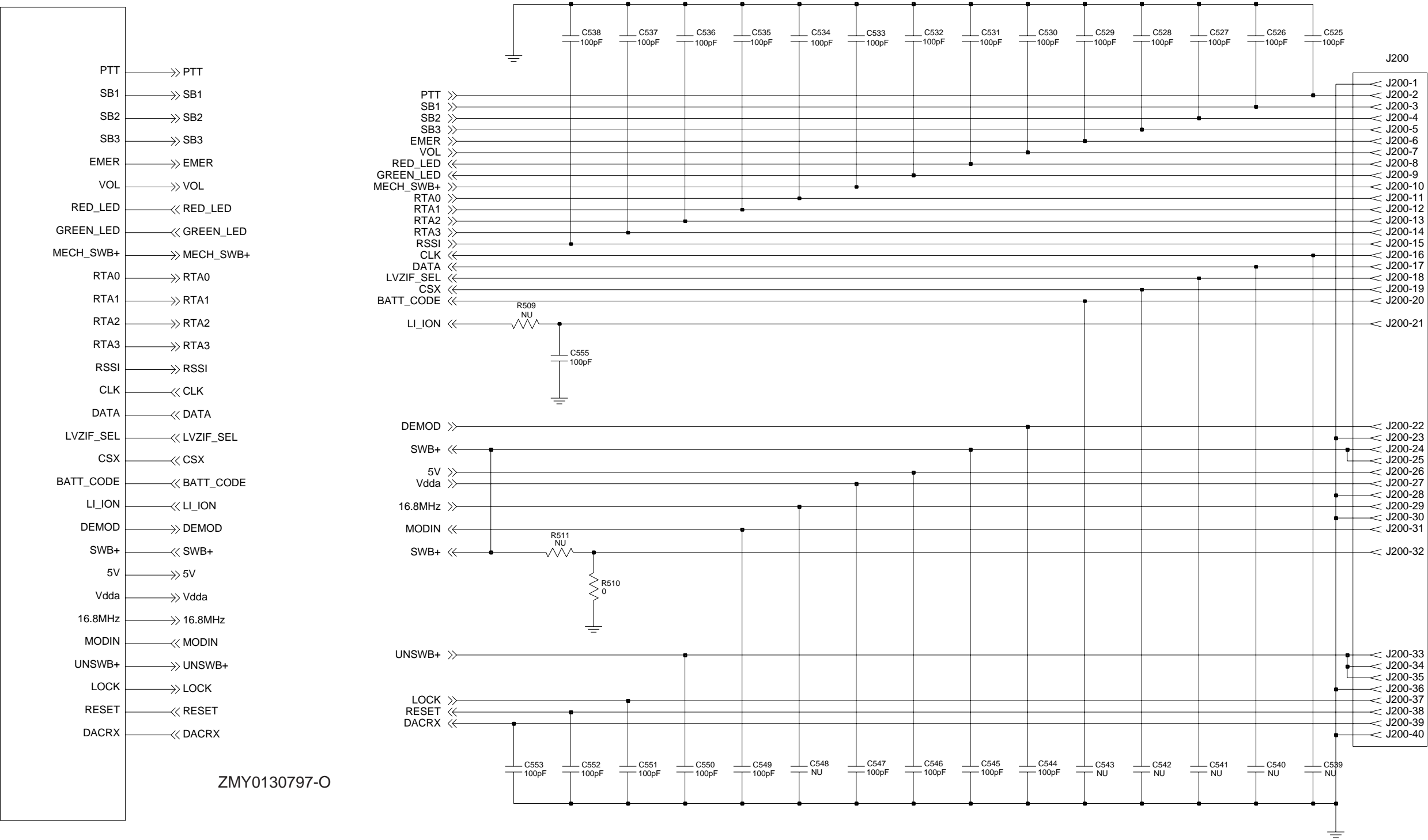


Figure 8-3: UHF Band 2 Controls And Switches Schematic Diagram

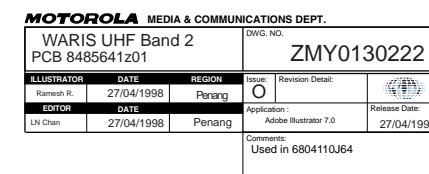


Figure 8-4: UHF Band 2 Receiver Front End Schematic Diagram

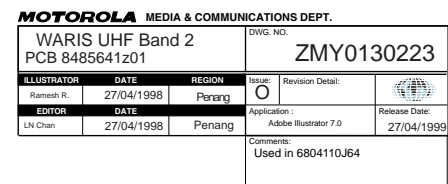


Figure 8-5: UHF Band 2 Receiver Back End Schematic Diagram

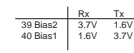
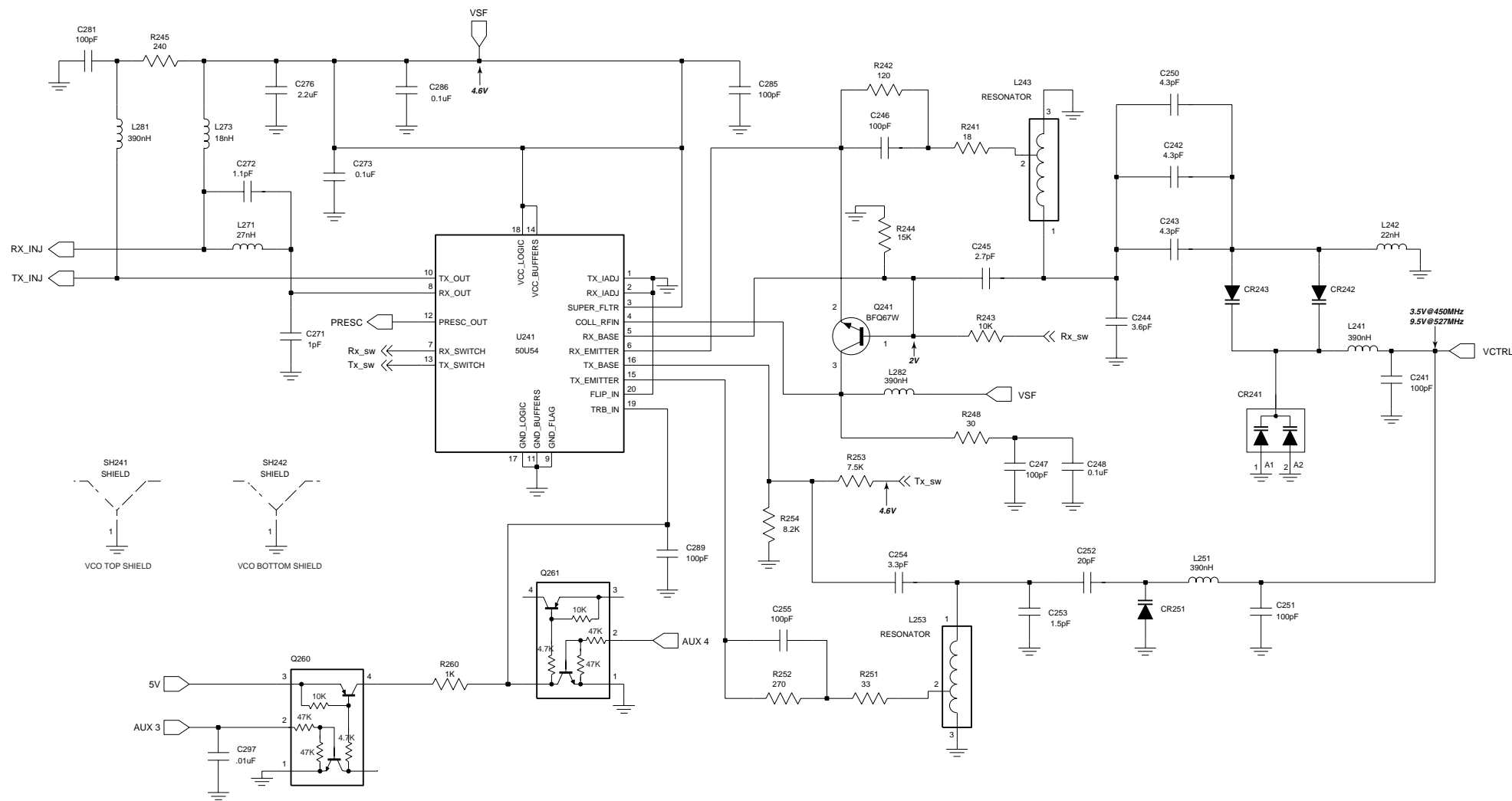
Main Board, RF Section-- Synthesizer

Figure 8-6: UHF Band 2 Synthesizer Schematic Diagram



MOTOROLA MEDIA & COMMUNICATIONS DEPT.			
WARIS UHF Band 2			
PCB 8485641z01			
ILLUSTRATOR	DATE	REGION	REV
Ramath R.	27/04/1998	Penang	0
DESIGNER	DATE	REGION	REV
Lin Chee	27/04/1998	Penang	0
Comments: Used in 6804110J64			

Main Board, RF Section-- VCO

Figure 8-7: UHF Band 2 Voltage Controlled Oscillator Schematic Diagram

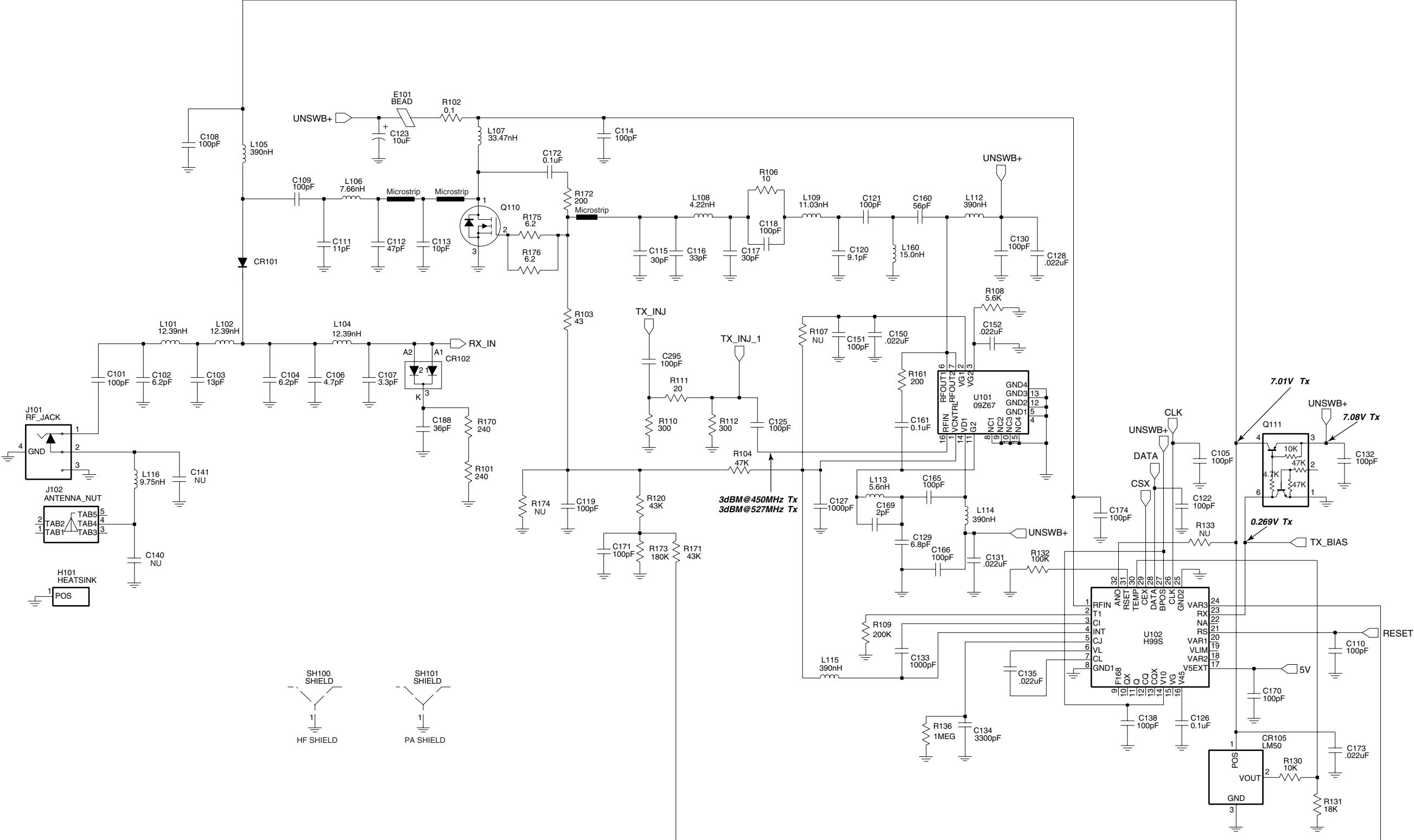


Figure 8-8: UHF Band 2 Transmitter Schematic Diagram

UHF Band 2 Radio Parts List

Circuit Ref	Motorola Part No.	Description
B501	0986237A02	Battery Contact Module
B503	3980502Z01	Backup Battery Contact, B+ (not used in GP328 Plus)
B504	3980501Z01	Backup Battery Contact, B- (not used in GP328 Plus)
C101	2113740F51	100pF
C102	2113740F22	6.2pF
C103	2113740F28	11pF
C104	2113740F22	6.2pF
C105	2113743N50	100pF
C106	2113740F19	4.7pF
C107	2113740F15	3.3pF
C108	2113743N50	100pF
C109	2113740F51	100pF
C110	2113743N50	100pF
C111	2103689A22	11pF
C112	2180605Z28	33pF
C113	2180605Z22	18pF
C114	2113743N50	100pF
C115	2113743N31	16pF
C116	2113743N27	11.0pF
C118	2113743N50	100pF
C119	2113743N50	100pF
C120	2113743N25	9.1pF
C121	2113743N50	100pF
C122	2113743N50	100pF
C123	2311049A18	10uF
C125	2113743N50	100pF
C126	2113743M24	0.1uF
C127	2113743L17	1000pF
C128	2113743M08	0.022uF
C129	2113743N23	7.5pF
C130	2113743N50	100pF
C131	2113743M08	0.022uF
C132	2113743N50	100pF
C133	2113743L17	1000pF
C134	2113743L29	3300pF
C135	2113743M08	0.022uF
C138	2113743N50	100pF
C141	2113740F25	8.2pF
C150	2113743M08	0.022uF
C151	2113743N50	100pF
C152	2113743M08	0.022uF
C160	2113743N44	56.0pF
C161	2113743M24	0.1uF
C165	2113743N44	56pF
C166	2113743N50	100pF
C169	2113743N09	2.0pF
C170	2113743N50	100pF

Circuit Ref	Motorola Part No.	Description
C171	2113743N50	100pF
C172	2113743E20	0.10uF
C173	2113743M08	0.022uF
C174	2113743N50	100pF
C188	2113743N39	36.0pF
C201	2113743N50	100pF
C202	2113743L17	1000pF
C203	2311049A56	4.7 uF
C204	2104993J02	2.2uF
C206	2113740F63	330pF
C207	2113743N40	39.0 pF
C210	2113743N50	100pF
C211	2113743N50	100pF
C212	2113743N50	100pF
C213	2113743N50	100pF
C214	2113743N50	100pF
C217	2104993J02	2.2uF
C218	2113743M24	0.1uF
C219	2113743K16	0.220uF
C220	2113743N50	100pF
C223	2113743M24	0.1uF
C224	2113743M24	0.1uF
C228	2311049J11	4.7uF
C229	2113743L17	1000pF
C230	2113743N50	100pF
C231	2113743M24	0.1uF
C232	2113743E12	0.047uF
C233	2311049A01	0.1 uF
C234	2311049A05	0.47uF
C235	2104993J02	2.2uF
C238	2113741F17	470pF
C241	2113743N50	100pF
C242	2113743N17	4.3 pF
C243	2113743N17	4.3 pF
C244	2113740F14	3.0pF
C245	2113743N12	2.7 pF
C246	2113743N50	100pF
C247	2113743N50	100pF
C248	2113743M24	0.1uF
C250	2113743N17	4.3 pF
C251	2113743N50	100pF
C252	2113743N26	10pF
C253	2113740F07	1.5pF
C254	2113743N26	10pF
C255	2113743N50	100pF
C257	2113743N50	100pF
C258	2113743L41	0.01uF
C259	2113743L41	0.01uF
C260	2113743N50	100pF
C263	2113743N02	0.75 pF
C264	2113743N50	100pF

Circuit Ref	Motorola Part No.	Description
C271	2113743N03	1.0 PF
C272	2113743N04	1.1pF
C273	2113743M24	0.1uF
C276	2104993J02	2.2uF
C277	2113743N50	100pF
C278	2311049A09	2.2 uF
C279	2104993J02	2.2uF
C281	2113743N50	100pF
C285	2113743N50	100pF
C286	2113743M24	0.1uF
C289	2113743N50	100pF
C291	2311049A69	10.0 uF
C292	2113743M24	0.1uF
C293	2113743A27	0.470uF
C294	2113743N50	100pF
C295	2113743N50	100pF
C296	2113743M24	0.1uF
C297	2113743L41	0.01uF
C298	2113743M24	0.1uF
C301	2113743N24	8.2 pF
C302	2113743N28	12.0pF
C303	2113740L09	4.3pF
C304	2113743N27	11.0pF
C305	2113743N24	8.2pF
C307	2113743M24	0.1uF
C308	2113743N50	100pF
C309	2113743N50	100pF
C310	2113743M24	0.1uF
C312	2113743N23	7.5 pF
C313	2113743N27	11.0pF
C314	2113743M24	0.1uF
C315	2113743N50	100pF
C316	2113740L09	4.3pF
C317	2113743N27	11.0pF
C318	2113743N23	7.5pF
C319	2113743N15	3.6 pF
C320	2113743N23	7.5pF
C321	2113743N50	100pF
C322	2113743N48	82.0 pF
C323	2113743N54	150 pF
C324	2113743N33	20.0pF
C325	2113743L41	0.01uF
C326	2113743L41	0.01uF
C327	2113743N50	100pF
C328	2113743M24	0.1uF
C329	2113743M24	0.1uF
C330	2113743N26	10.0pF
C331	2113743N50	100pF
C334	2113743M08	0.022uF
C336	2113743M24	0.1uF
C337	2113743N50	100pF

Circuit Ref	Motorola Part No.	Description
C338	2113743N30	15.0pF
C339	2180478Z20	1.0uF
C340	2180478Z20	1.0uF
C341	2180478Z20	1.0uF
C342	2180478Z20	1.0uF
C343	2113743A23	0.220uF
C344	2113743M24	0.1uF
C345	2113743M24	0.1uF
C346	2113743M24	0.1uF
C347	2113743M24	0.1uF
C348	2113743M24	0.1uF
C349	2113743E07	0.022uF
C350	2113743L05	330pF
C351	2113743N33	20.0pF
C352	2113743N28	12.0pF
C353	2113743N41	43.0 pF
C354	2113743N42	47.0pF
C355	2113743A24	0.330uF
C356	2113743M08	0.022uF
C357	2113743A23	0.220uF
C358	2113741A23	1200pF
C359	2109720D14	0.1uF
C360	2113743E07	0.022uF
C361	2113741F49	10nF
C362	2113743M08	0.022uF
C363	2311049A40	2.2 uF
C364	2113743L41	0.01uF
C370	2113743N50	100pF
C374	2113743N50	100pF
C375	2113743N50	100pF
C380	2113743L41	0.01uF
C381	2113743N18	4.7 pF
C382	2311049A59	10uF
C383	2113743N50	100pF
C384	2113743N44	56.0 pF
C385	2113743N44	56.0 pF
C386	2113743N50	100pF
C390	2113743N50	100pF
C395	2113743N50	100pF
C397	2311049A07	1.0uF
CR101	4880973Z02	Pin Diode
CR102	4802245J41	Pin Diode
CR105	5185963A15	Temperature Sense
CR201	4802233J09	Triple Diode
CR203	4862824C03	Varactor
CR241	4805649Q13	Dual Varactor
CR242	4862824C01	Varactor
CR243	4862824C01	Varactor
CR251	4802245J22	Diode Varactor
CR301	4862824C01	Varactor
CR302	4862824C01	Varactor

Circuit Ref	Motorola Part No.	Description
CR303	4880154K03	Dual Common Anode-Cathode
CR304	4862824C01	Varactor
CR305	4862824C01	Varactor
CR306	4802245J42	Ring Quad Diode
CR308	4802245J41	Pin Diode
CR310	4862824C01	Varactor
CR501	4880107R01	Rectifier
CR503	4805729G49	Led Red/Yel
E101	2484657R01	Ferrite Bead
F501	6580542Z01	FUSE 3A
FL201	4805875Z04	16.8Mhz Xtal
FL301	4802245J43	Xtal Filter 45.1 Mhz
H101	2680499Z01	Heat Spreader
J101	0985613Z01	JACK,RF
J102	0280519Z02	NUT, ANTENNA
J200	0905505Y04	20 PINS CONNECTOR
L101	2460591B28	13.37nH
L102	2460591B28	13.37nH
L104	2460591B48	15.22nH
L105	2462587N22	390 nH
L106	2460591A19	8.71nH
L107	2479990G01	33.47nH
L108	2479990A01	4.22nH
L112	2462587N42	12 nH
L113	2413926H09	5.6nH
L114	2462587N42	12nH
L115	2462587N22	391 nH
L116	2479990C02	16.28nH
L117	2409154M17	22.0nH
L160	2413926H14	15.0nH
L201	2462587Q20	2.2uH
L202	2462587Q20	2.2uH
L203	2462587Q20	2.2uH
L232	2462587P25	12uH
L241	2462587V41	390 nH
L242	2462587V26	22 nH
L243	2460593C03	Teflon Resonator
L251	2462587V41	390 nH
L253	2460593C03	Teflon Resonator
L261	2462587V29	39 nH
L271	2462587V27	27 nH
L273	2462587V25	18 nH
L281	2462587V41	390 nH
L282	2462587V41	393 nH
L301	2479990B01	11.03nH
L302	2479990B01	11.03nH
L303	2462587V26	23 nH
L304	2462587V37	180 nH
L305	2462587V23	12 nH
L306	2479990B01	11.03nH

Circuit Ref	Motorola Part No.	Description
L307	2479990B01	11.03nH
L309	2479990C02	16.28nH
L310	2462587V36	150nH
L311	2462587N65	750 nH
L314	2462587N72	2.2 uH
L325	2480646Z20	2.20uH
L330	2462587N64	680 nH
L331	2480646Z20	2.20uH
L332	2462587N53	100 nH
L340	2462587V41	394 nH
L400	2462587Q42	390NH
L401	2462587Q42	390NH
L410	2462587Q42	390NH
L411	2462587Q42	390NH
L505	2462587Q42	390nH
P100	3905643V01	Gnd Contact Finger
PB501	4070354A01	Tactile,Pushbutton
PB502	4070354A01	Tactile,Pushbutton
PB504	4070354A01	Tactile,Pushbutton
PB505	4070354A01	Tactile,Pushbutton
Q110	4813828A09	RF Power FET
Q111	4802245J50	Dual NPN/PNP
Q210	4802245J50	Dual NPN/PNP
Q241	4805218N63	NPN
Q260	4802245J50	Dual NPN/PNP
Q261	4802245J50	Dual NPN/PNP
Q301	4802245J44	NPN
Q302	4802245J44	NPN
Q315	4880214G02	NPN
Q320	4805218N63	NPN
Q400	4809579E18	MOSFET P-CHAN
Q403	4813824A17	TSTR MMBT3906
Q405	4802245J54	Dual NPN
Q410	4802245J54	Dual NPN
Q417	4802245J50	Dual NPN/PNP
Q502	5180159R01	Dual NPN
Q505	4880214G02	NPN
R101	0662057A34	240
R102	0680539Z01	POWER METAL STRIP RESISTORS
R104	0662057N15	47K
R106	0662057M26	10
R108	0662057M92	5.6K
R109	0662057N30	200K
R110	0662057M61	300
R112	0662057M61	300
R120	0662057N14	43K
R130	0662057M98	10K
R131	0662057N05	18K
R132	0662057N33	270K
R136	0662057N47	1M

Circuit Ref	Motorola Part No.	Description
R161	0662057M57	200
R170	0662057A34	240
R171	0662057N14	43K
R172	0662057A32	200
R173	0662057N29	180K
R175	0662057B59	3
R176	0662057B59	3
R191	0662057C01	0
R201	0662057N21	82K
R202	0662057N23	100K
R204	0662057N15	47K
R231	0662057M52	120
R232	0662057M69	620
R233	0662057M68	560
R241	0662057M32	18
R242	0662057M52	120
R243	0662057M98	10K
R244	0662057N03	15K
R245	0662057M59	240
R248	0662057M33	20
R248	0662057M37	30
R251	0662057M38	33
R252	0662057M60	270
R253	0662057M95	7.5K
R254	0662057M96	8.2K
R255	0662057M89	4.3K
R256	0662057M37	30
R260	0662057M74	1K
R300	0662057M82	2.2K
R301	0662057N23	100K
R302	0662057N23	100K
R303	0662057M78	1.5K
R304	0662057N01	12K
R305	0662057M66	470
R306	0662057N23	100K
R307	0662057N23	100K
R308	0662057M60	270
R309	0662057M32	18
R310	0662057M60	270
R311	0662057N10	30K
R312	0662057M83	2.4K
R313	0662057M62	330
R314	0662057M85	3K
R315	0662057N01	12K
R316	0662057A96	91K
R317	0662057M74	1K
R318	0662057A79	18K
R319	0662057A29	150
R320	0662057M74	1K
R321	0662057M83	2.4K
R322	0662057N30	200K

Circuit Ref	Motorola Part No.	Description
R324	0662057M81	2K
R325	0662057M94	6.8K
R327	0662057N11	33K
R328	0662057M12	2.7
R329	0662057M01	0
R339	0662057M01	0
R340	0662057M96	8.2K
R342	0662057N23	100K
R343	0662057M26	10
R344	0662057N01	12K
R345	0662057M98	10K
R346	0662057N17	56K
R347	0662057M74	1K
R348	0662057M87	3.6K
R349	0662057C01	0
R350	0662057N23	100K
R351	0662057C01	0
R352	0662057M86	3.3K
R355	0662057M01	0
R509	0662057M01	0
RT300	0680590Z01	THERMISTOR_33K
RT400	0680590Z01	Thermistor 33K
S501	4080710Z01	Channel Switch
	4080710Z02	**Frequency Switch
S502	1880619Z02	Volume Switch
SH100	2680507Z01	Harmonic Filter Shield
SH101	2680510Z01	PA Shield
SH201	2680511Z01	Synthesizer Shield
SH202	2680511Z01	Synthesizer Shield
SH241	2604120G01	VCO Top Shield
SH242	2680514Z01	VCO Bottom Shield
SH301	2680554Z01	Rx Pre-filter Shield
SH302	2680555Z01	RX Post-filter Shield
SH303	2680509Z01	Mixer Shield
SH304	2680624Z01	Mixer Diode Shield
SH321	2680508Z01	Zif 2nd LO
SH322	2680514Z01	Zif Shield
SH323	2604082P01	AOBA Xtal Filter Shield
T301	2580541Z02	XFMR Coil
T302	2580541Z02	XFMR Coil
U101	5185130C65	LDMOS Driver
U102	5185765B28	Power Control IC
U201	5185963A27	LVFRACN
U210	5102463J61	Inverter
U211	5102463J61	Inverter
U241	5105750U54	VCO Buffer
U247	5105739X05	Regulator Linear
U248	5102463J58	3.3V Regulator
U301	5109632D83	LVZIF

* Motorola Depot Servicing only

** For EX600 XLS models only

8.2 UHF Band 2, Circuit Board/Schematic Diagrams and Parts List (PCB No.8471475L01)

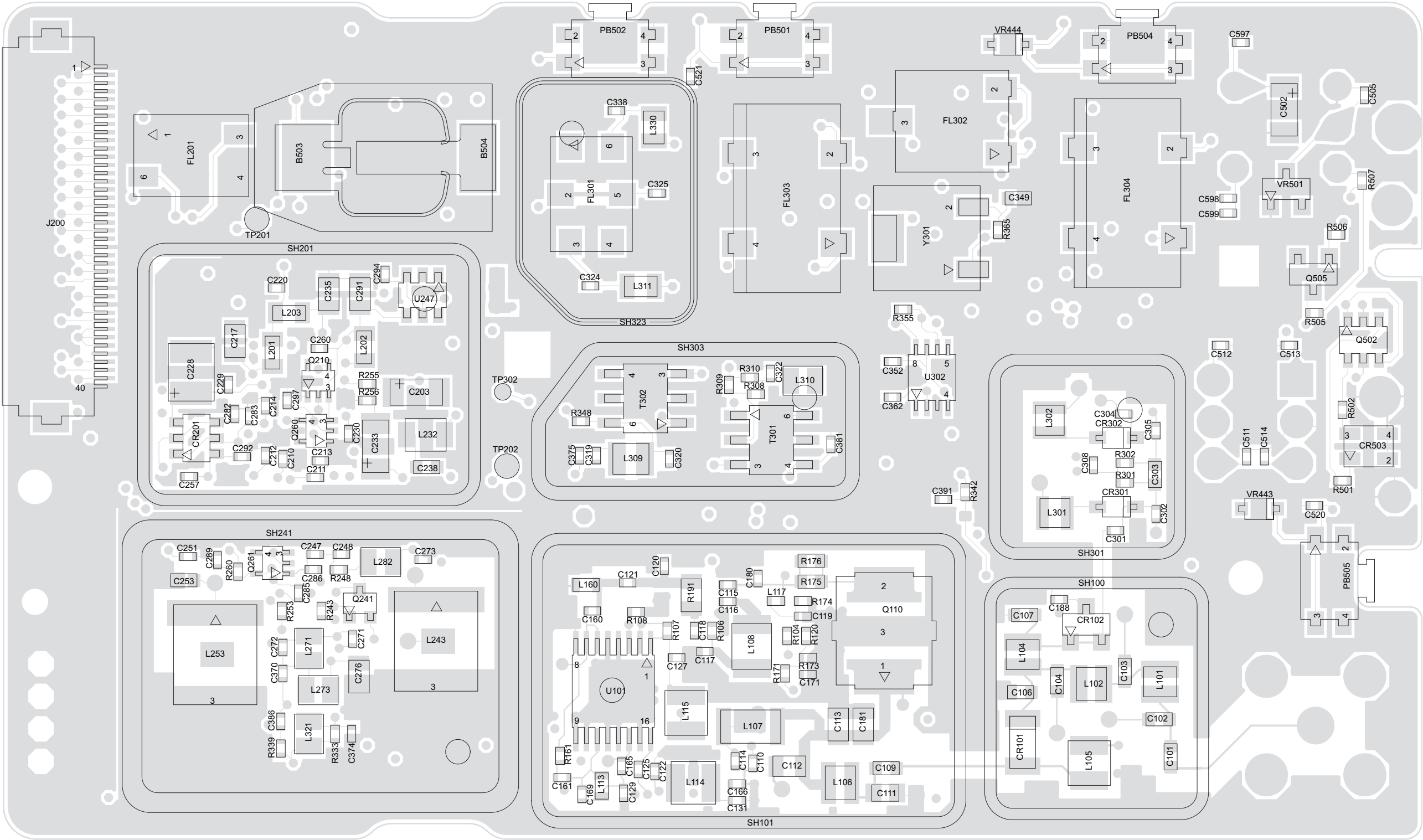


Figure 8-9: UHF Band 2 (450-527MHz) Main Board Top Side PCB No.8471475L01

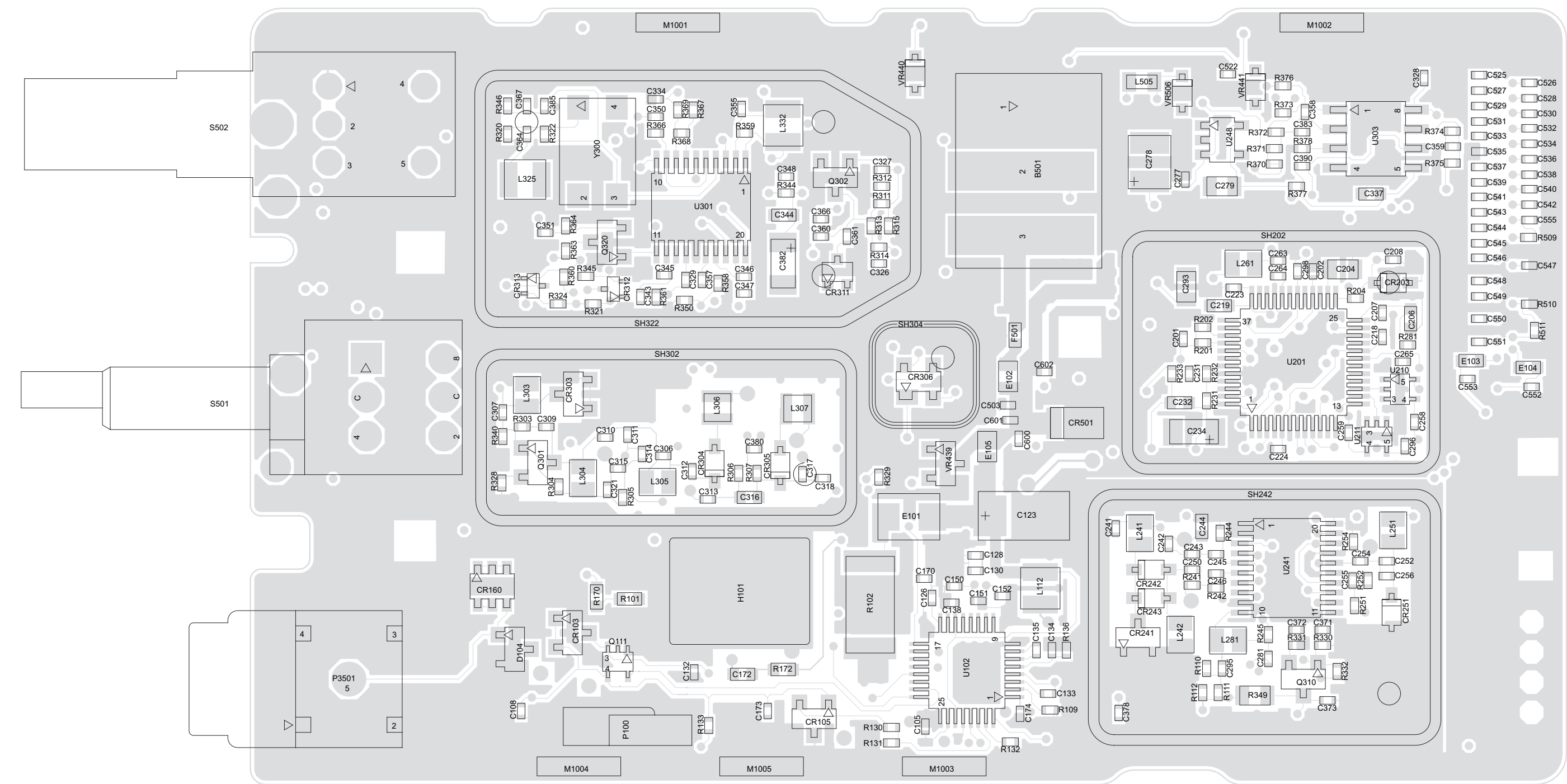


Figure 8-10: UHF Band 2 (450-527MHz) Main Board Bottom Side PCB No. 8471475L01

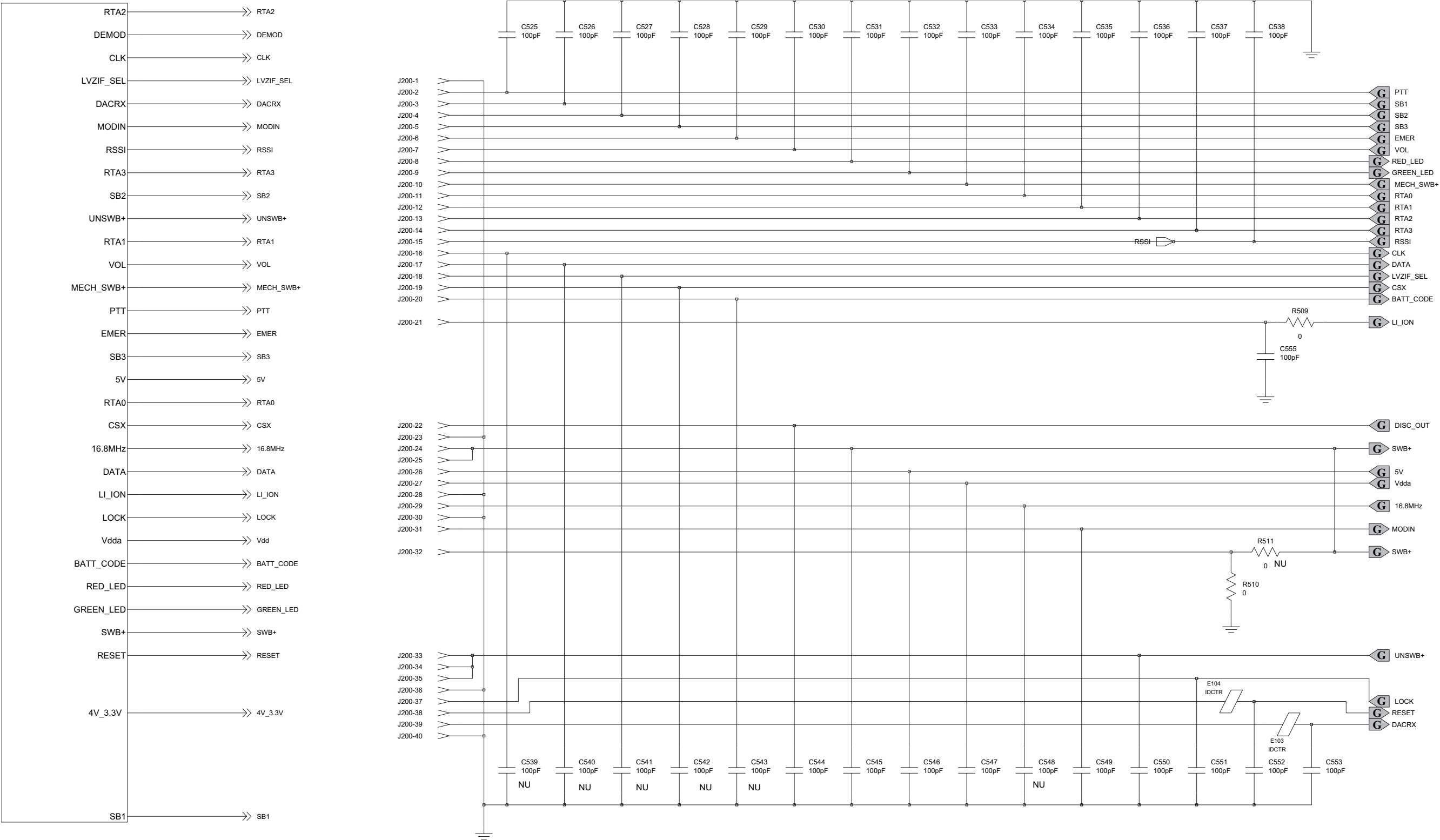


Figure 8-11: UHF Band 2 Controls And Switches Schematic Diagram for PCB No. 8471475L01(sheet 1 of 2)

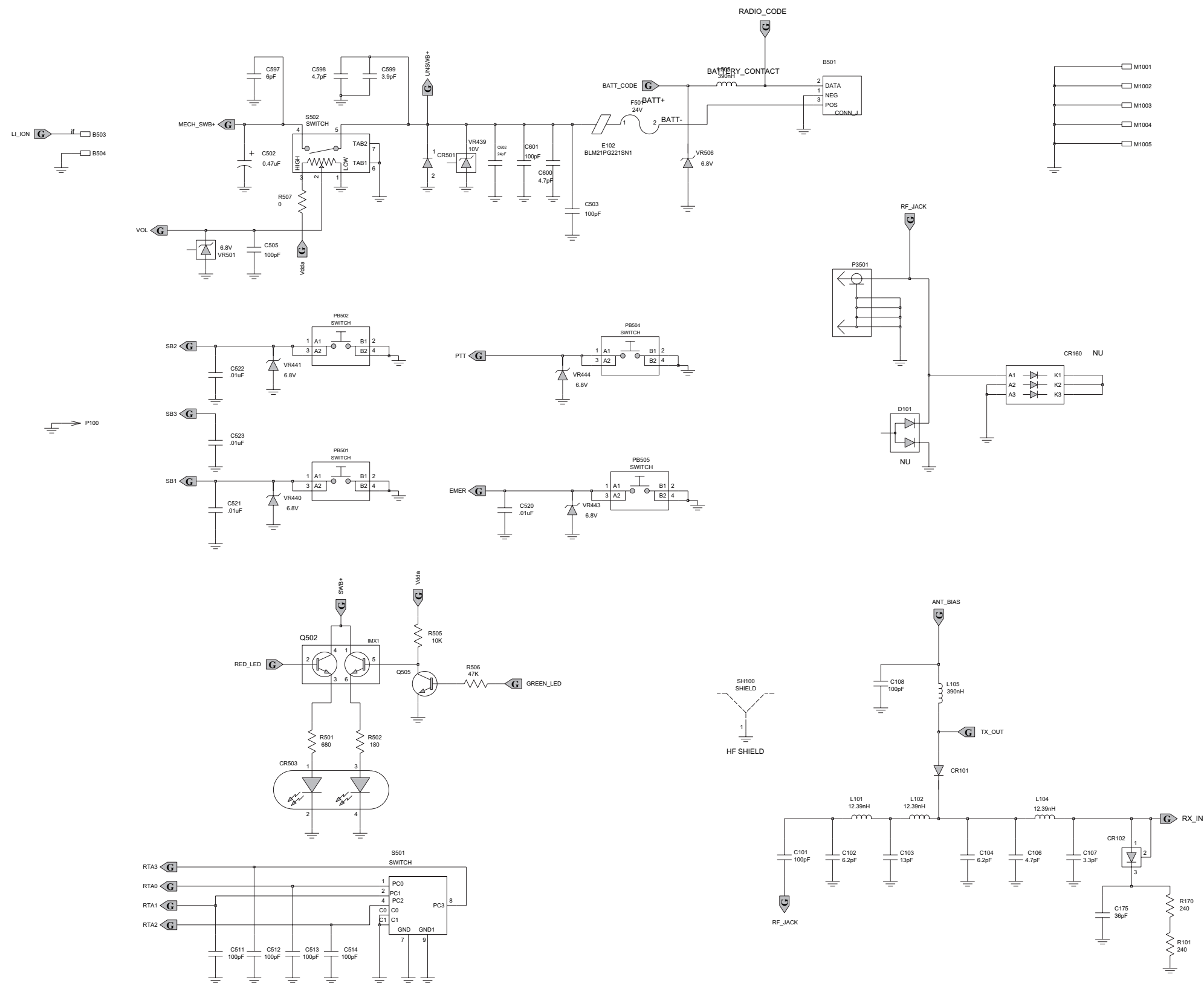
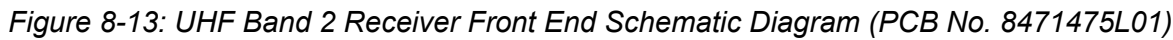
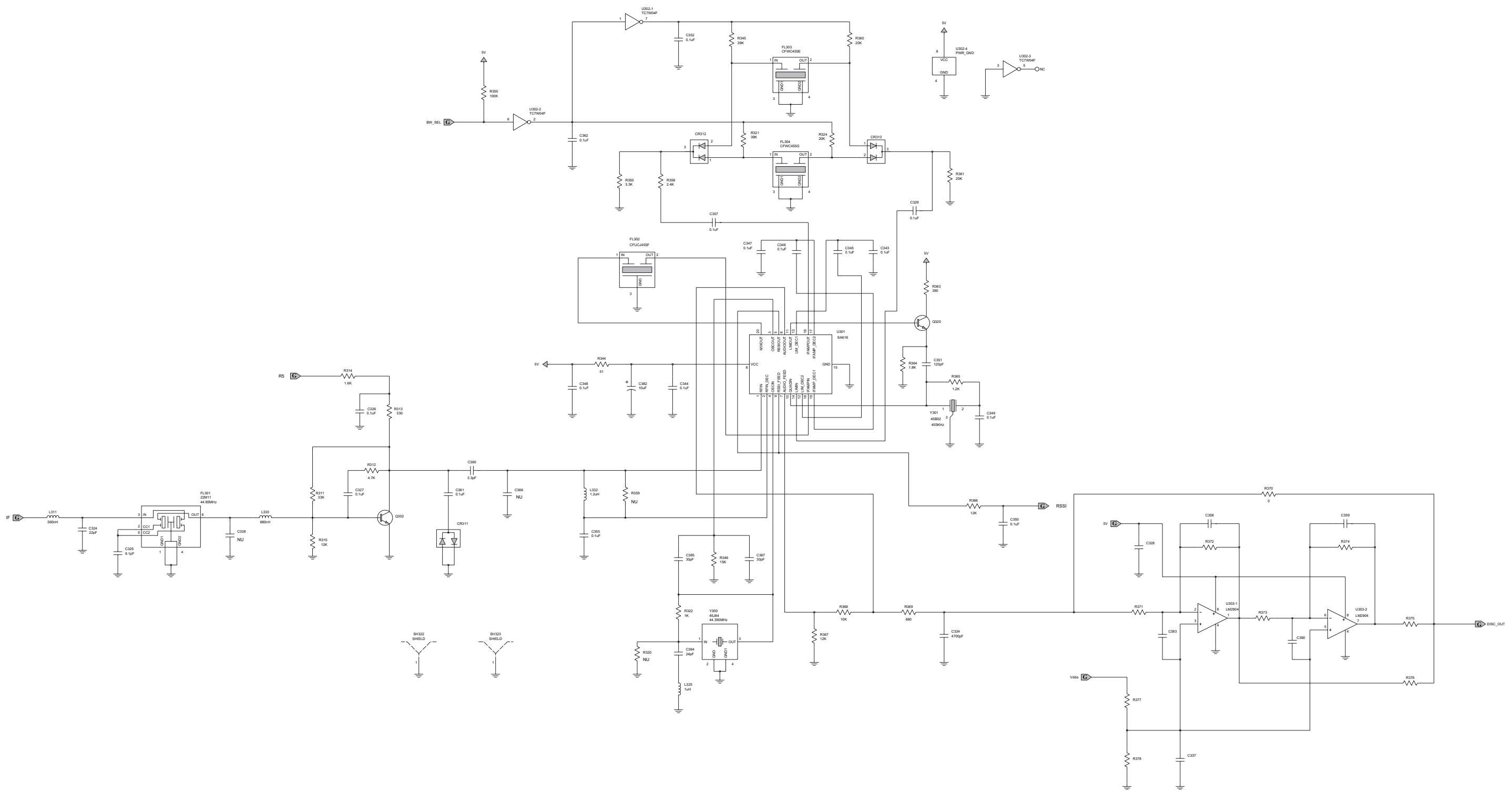


Figure 8-12: UHF Band 2 Controls And Switches Schematic Diagram for PCB No. 8471475L01(sheet 2 of 2)





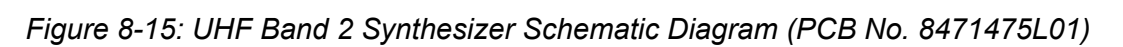


Figure 8-15: UHF Band 2 Synthesizer Schematic Diagram (PCB No. 8471475L01)

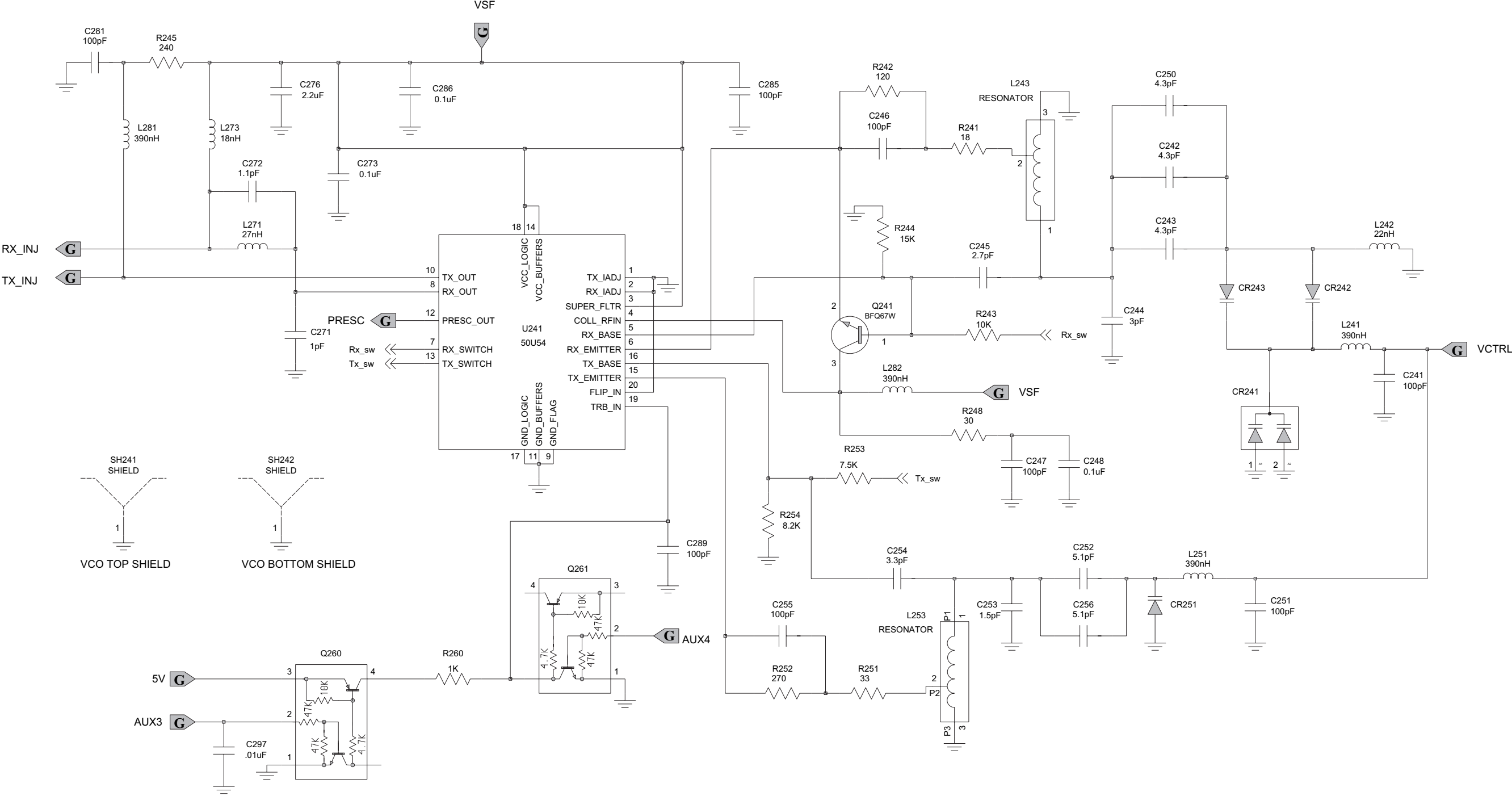


Figure 8-16: UHF Band 2 Voltage Controlled Oscillator Schematic Diagram (PCB No. 8471475L01)

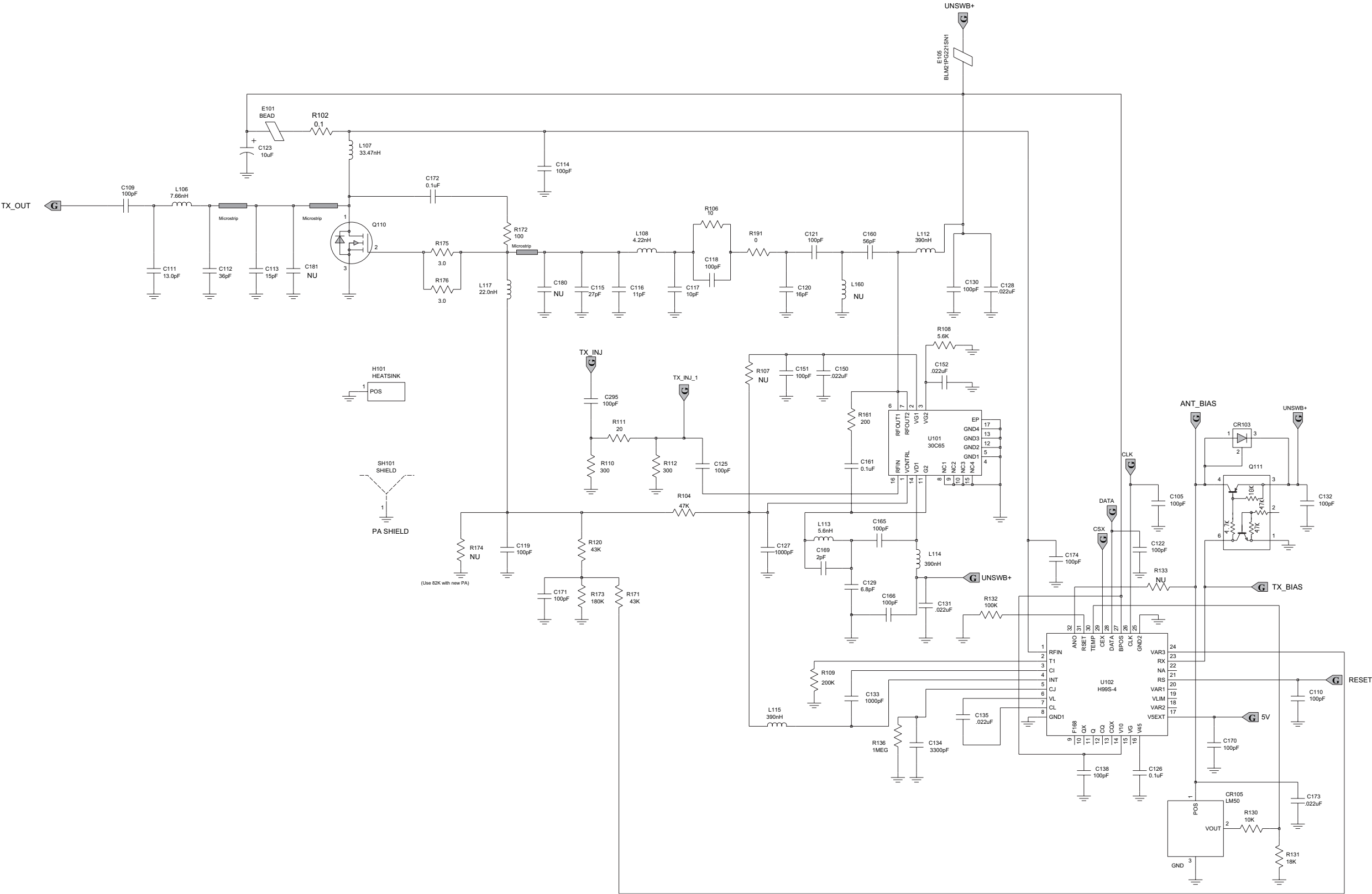


Figure 8-17: UHF Band 2 Transmitter Schematic Diagram (PCB No. 8471475L01)

UHF Band 2 Radio Parts List (PCB No. 8471475L01)

Circuit Ref	Motorola Part No.	Description
B501	8471475L01 0986237A02	EPP MINNOW UHF 2 CONNECTOR (CONTACT BATTERY)
B503	3980502Z01	CONTACT, BACKUP B+
B504	3980501Z01	CONTACT, BACKUP B-
C101	2113944C45	CAP CER CHP 100.0PF 50V 5%
C102	2113944C72	CAP,FXD,6.2PF,.25PF+/- ,50V-DC,
C103	2113944C77	CAP,FXD,11PF,+5%,-5%,50V- DC,0
C104	2113944C72	CAP,FXD,6.2PF,.25PF+/- ,50V-DC,
C105	2113944A40	CAP CER CHP 100.0PF 50V 5%
C106	2113944C22	CAP CER CHP 4.7PF 50V +/- 0.25
C107	2113944C18	CAP CER CHP 3.3PF 50V +/- 0.25
C108	2113944A40	CAP CER CHP 100.0PF 50V 5%
C109	2113944C45	CAP CER CHP 100.0PF 50V 5%
C110	2113944A40	CAP CER CHP 100.0PF 50V 5%
C111	2115938H01	CAP CHIP CL1 11.0 +/-0.05 PF
C112	2115937H03	HIGH Q CHIP CAPACITOR, 33PF
C113	2115937H02	HIGH Q CHIP CAPACITOR, 15PF
C114	2113944A40	CAP CER CHP 100.0PF 50V 5%
C115	2113944A79	CAP,FXD,16PF,+5%,-5%,50V- DC,04
C116	2113944A77	CAP,FXD,11PF,+5%,-5%,50V- DC,04
C118	2113944A40	CAP CER CHP 100.0PF 50V 5%
C119	2113944A40	CAP CER CHP 100.0PF 50V 5%
C120	2113944A22	CAP CER CHP 7.5PF 50V +/- 0.5P
C121	2113944A40	CAP CER CHP 100.0PF 50V 5%
C122	2113944A40	CAP CER CHP 100.0PF 50V 5%

Circuit Ref	Motorola Part No.	Description
C123	2313960F04	CAP TANT 33 UF 10% 16V 6032-28
C125	2113944A40	CAP CER CHP 100.0PF 50V 5%
C126	2113946K02	CAP CER CHP 0.10UF 16V
C127	2113945A09	CAP CER CHP 1000PF 50V 10%
C128	2113945B04	CAP,FXD,.022UF,+10%,- 10%,25V-D
C129	2113944A22	CAP CER CHP 7.5PF 50V +/- 0.5P
C130	2113944A40	CAP CER CHP 100.0PF 50V 5%
C131	2113945B04	CAP,FXD,.022UF,+10%,- 10%,25V-D
C132	2113944A40	CAP CER CHP 100.0PF 50V 5%
C133	2113945A09	CAP CER CHP 1000PF 50V 10%
C134	2113945A12	CAP CER CHP 3300PF 50V 10%
C135	2113945B04	CAP,FXD,.022UF,+10%,- 10%,25V-D
C138	2113944A40	CAP CER CHP 100.0PF 50V 5%
C150	2113945B04	CAP,FXD,.022UF,+10%,- 10%,25V-D
C151	2113944A40	CAP CER CHP 100.0PF 50V 5%
C152	2113945B04	CAP,FXD,.022UF,+10%,- 10%,25V-D
C160	2113944A34	CAP CER CHP 56.0PF 50V 5%
C161	2113946K02	CAP CER CHP 0.10UF 16V
C165	2113944A34	CAP CER CHP 56.0PF 50V 5%
C166	2113944A40	CAP CER CHP 100.0PF 50V 5%
C169	2113944A08	CAP CER CHP 2.0PF 50V +/- 0.25
C170	2113944A40	CAP CER CHP 100.0PF 50V 5%
C171	2113944A40	CAP CER CHP 100.0PF 50V 5%
C172	2113945D04	CAP CER CHP 100,000PF 25V 10%
C173	2113945B04	CAP,FXD,.022UF,+10%,- 10%,25V-D
C174	2113944A40	CAP CER CHP 100.0PF 50V 5%

Circuit Ref	Motorola Part No.	Description
C188	2113944A83	CAP,FXD,36PF,+5%,-5%,50V- DC,0
C201	2113944A40	CAP CER CHP 100.0PF 50V 5%
C202	2113945A09	CAP CER CHP 1000PF 50V 10%
C203	2313960B30	CAP,FXD,4.7UF,+10%,- 10%,10V-DC
C204	2113946N03	CAP CER CHP 2.2UF 16V
C206	2113944C04	CAP CER CHP 330.0PF 50V 5%
C207	2113944A32	CAP CER CHP 39.0PF 50V 5%
C210	2113944A40	CAP CER CHP 100.0PF 50V 5%
C211	2113944A40	CAP CER CHP 100.0PF 50V 5%
C212	2113944A40	CAP CER CHP 100.0PF 50V 5%
C213	2113944A40	CAP CER CHP 100.0PF 50V 5%
C214	2113944A40	CAP CER CHP 100.0PF 50V 5%
C217	2113946N03	CAP CER CHP 2.2UF 16V
C218	2113946K02	CAP CER CHP 0.10UF 16V
C219	2113946L03	CAP CER CHP 0.22UF 16V
C220	2113944A40	CAP CER CHP 100.0PF 50V 5%
C223	2113946K02	CAP CER CHP 0.10UF 16V
C224	2113946K02	CAP CER CHP 0.10UF 16V
C228	2313960D05	CAP,FXD,4.7UF,+10%,- 10%,16V-DC
C229	2113945A09	CAP CER CHP 1000PF 50V 10%
C230	2113944A40	CAP CER CHP 100.0PF 50V 5%
C231	2113946K02	CAP CER CHP 0.10UF 16V
C232	2113945D02	CAP CER CHP 47,000PF 25V 10%
C233	2313960A26	CAP,FXD,.1UF,+10%,- 10%,35V-DC,
C234	2313960A55	CAP,FXD,.47UF,+10%,- 10%,25V-DC
C235	2113946N03	CAP CER CHP 2.2UF 16V
C238	2113945L17	CAP,FXD,470PF,+5%,- 5%,50V-DC,0
C241	2113944A40	CAP CER CHP 100.0PF 50V 5%
C242	2113944A16	CAP CER CHP 4.3PF 50V +/- 0.25

Circuit Ref	Motorola Part No.	Description
C243	2113944A16	CAP CER CHP 4.3PF 50V +/- 0.25
C244	2113944C17	CAP CER CHP 3.0PF 50V +/- 0.25
C245	2113944A11	CAP CER CHP 2.7PF 50V +/- 0.25
C246	2113944A40	CAP CER CHP 100.0PF 50V 5%
C247	2113944A40	CAP CER CHP 100.0PF 50V 5%
C248	2113946K02	CAP CER CHP 0.10UF 16V
C250	2113944A16	CAP CER CHP 4.3PF 50V +/- 0.25
C251	2113944A40	CAP CER CHP 100.0PF 50V 5%
C252	2113944A16	CAP CER CHP 4.3PF 50V +/- 0.25
C253	2113944C12	CAP CER CHP 1.8PF 50V +/- 0.25
C254	2113944A25	CAP CER CHP 10.0PF 50V +/- - 0.5
C255	2113944A40	CAP CER CHP 100.0PF 50V 5%
C256	2113944A16	CAP CER CHP 4.3PF 50V +/- 0.25
C257	2113944A40	CAP CER CHP 100.0PF 50V 5%
C258	2113945B02	CAP CER CHP 10,000PF 25V 10%
C259	2113945B02	CAP CER CHP 10,000PF 25V 10%
C260	2113944A40	CAP CER CHP 100.0PF 50V 5%
C263	2113944A62	CAP,FXD,.75PF,.25PF+/- ,50V-DC,
C264	2113944A40	CAP CER CHP 100.0PF 50V 5%
C272	2115153H01	CAP, CERAMIC, COG
C273	2113946K02	CAP CER CHP 0.10UF 16V
C276	2113946N03	CAP CER CHP 2.2UF 16V
C277	2113944A40	CAP CER CHP 100.0PF 50V 5%
C278	2313960D07	CAP,FXD,10,+10,-10,16,SM,- 55M
C279	2113946N03	CAP CER CHP 2.2UF 16V
C281	2113944A40	CAP CER CHP 100.0PF 50V 5%
C285	2113944A40	CAP CER CHP 100.0PF 50V 5%
C286	2113946K02	CAP CER CHP 0.10UF 16V

Circuit Ref	Motorola Part No.	Description
C289	2113944A40	CAP CER CHP 100.0PF 50V 5%
C291	2313960M51	CAP,FXD,10UF,+10%,-10%,6.3V-DC
C292	2113946K02	CAP CER CHP 0.10UF 16V
C293	2113945G98	CAP,FXD,.47UF,+10%,-10%,50V-DC
C294	2113944A40	CAP CER CHP 100.0PF 50V 5%
C295	2113944A40	CAP CER CHP 100.0PF 50V 5%
C296	2113946K02	CAP CER CHP 0.10UF 16V
C297	2113945B02	CAP CER CHP 10,000PF 25V 10%
C298	2113946K02	CAP CER CHP 0.10UF 16V
C301	2113944A23	CAP CER CHP 8.2PF 50V +/-0.5P
C302	2113944A26	CAP CER CHP 12.0PF 50V 5%
C303	2113944C21	CAP CER CHP 4.3PF 50V +/-0.25
C304	2113944A77	CAP,FXD,11PF,+5%,-5%,50V-DC,04
C305	2113944A40	CAP CER CHP 100.0PF 50V 5%
C307	2113944A40	CAP CER CHP 100.0PF 50V 5%
C308	2113944A40	CAP CER CHP 100.0PF 50V 5%
C309	2113944A40	CAP CER CHP 100.0PF 50V 5%
C310	2113944A40	CAP CER CHP 100.0PF 50V 5%
C312	2113944A22	CAP CER CHP 7.5PF 50V +/-0.5P
C313	2113944A77	CAP,FXD,11PF,+5%,-5%,50V-DC,04
C314	2113946K02	CAP CER CHP 0.10UF 16V
C315	2113944A40	CAP CER CHP 100.0PF 50V 5%
C316	2113944C21	CAP CER CHP 4.3PF 50V +/-0.25
C317	2113944A73	CAP,FXD,8PF,.5PF+/-,50V-DC,040
C318	2113944A26	CAP CER CHP 12.0PF 50V 5%
C319	2113944A16	CAP CER CHP 4.3PF 50V +/-0.25
C320	2113944A24	CAP CER CHP 9.1PF 50V +/-0.5P

Circuit Ref	Motorola Part No.	Description
C321	2113944A40	CAP CER CHP 100.0PF 50V 5%
C322	2113944A38	CAP CER CHP 82.0PF 50V 5%
C324	2115153H40	CAP, CERAMIC, COG
C325	2115153H26	CAP, CERAMIC, COG
C326	2113946K02	CAP CER CHP 0.10UF 16V
C327	2113946K02	CAP CER CHP 0.10UF 16V
C329	2113946K02	CAP CER CHP 0.10UF 16V
C334	2113945A13	CAP CER CHP 4700PF 50V 10%
C343	2113946K02	CAP CER CHP 0.10UF 16V
C344	2113945D04	CAP CER CHP 100,000PF 25V 10%
C345	2113946K02	CAP CER CHP 0.10UF 16V
C346	2113946K02	CAP CER CHP 0.10UF 16V
C347	2113946K02	CAP CER CHP 0.10UF 16V
C349	2113945D04	CAP CER CHP 100,000PF 25V 10%
C350	2113946K02	CAP CER CHP 0.10UF 16V
C351	2113944A41	CAP CER CHP 120.0PF 50V 5%
C352	2113946K02	CAP CER CHP 0.10UF 16V
C355	2113946K02	CAP CER CHP 0.10UF 16V
C357	2113946K02	CAP CER CHP 0.10UF 16V
C360	2113944A13	CAP CER CHP 3.3PF 50V +/-0.25
C361	2113946K02	CAP CER CHP 0.10UF 16V
C362	2113946K02	CAP CER CHP 0.10UF 16V
C364	2113944A81	CAP,FXD,24PF,+5%,-5%,50V-DC,04
C367	2113944A82	CAP,FXD,30PF,+5%,-5%,50V-DC,04
C370	2115153H18	CAP, CERAMIC, COG
C372	2113944A40	CAP CER CHP 100.0PF 50V 5%
C374	2113944A40	CAP CER CHP 100.0PF 50V 5%
C375	2113944A40	CAP CER CHP 100.0PF 50V 5%
C380	2113945B02	CAP CER CHP 10,000PF 25V 10%
C382	2313960B57	CAP,FXD,10UF,+10%,-10%,6.3V-DC
C385	2113944A81	CAP,FXD,24PF,+5%,-5%,50V-DC,04
C386	2113944A40	CAP CER CHP 100.0PF 50V 5%
C391	2113944A84	CAP,FXD,43PF,+5%,-5%,50V-DC,04

Circuit Ref	Motorola Part No.	Description
C502	2313960A55	CAP,FXD,.47UF,+10%,-10%,25V-DC
C503	2113944A84	CAP,FXD,43PF,+5%,-5%,50V-DC,04
C505	2113944A40	CAP CER CHP 100.0PF 50V 5%
C511	2113944A40	CAP CER CHP 100.0PF 50V 5%
C512	2113944A40	CAP CER CHP 100.0PF 50V 5%
C513	2113944A40	CAP CER CHP 100.0PF 50V 5%
C514	2113944A40	CAP CER CHP 100.0PF 50V 5%
C520	2113945B02	CAP CER CHP 10,000PF 25V 10%
C521	2113945B02	CAP CER CHP 10,000PF 25V 10%
C522	2113945B02	CAP CER CHP 10,000PF 25V 10%
C525	2113944A40	CAP CER CHP 100.0PF 50V 5%
C526	2113944A40	CAP CER CHP 100.0PF 50V 5%
C527	2113944A40	CAP CER CHP 100.0PF 50V 5%
C528	2113944A40	CAP CER CHP 100.0PF 50V 5%
C529	2113944A40	CAP CER CHP 100.0PF 50V 5%
C530	2113944A40	CAP CER CHP 100.0PF 50V 5%
C531	2113944A40	CAP CER CHP 100.0PF 50V 5%
C532	2113944A40	CAP CER CHP 100.0PF 50V 5%
C533	2113944A40	CAP CER CHP 100.0PF 50V 5%
C534	2113944A40	CAP CER CHP 100.0PF 50V 5%
C535	2113944A40	CAP CER CHP 100.0PF 50V 5%
C536	2113944A40	CAP CER CHP 100.0PF 50V 5%
C537	2113944A40	CAP CER CHP 100.0PF 50V 5%
C538	2113944A40	CAP CER CHP 100.0PF 50V 5%
C544	2113944A40	CAP CER CHP 100.0PF 50V 5%

Circuit Ref	Motorola Part No.	Description
C545	2113944A40	CAP CER CHP 100.0PF 50V 5%
C546	2113944A40	CAP CER CHP 100.0PF 50V 5%
C547	2113944A40	CAP CER CHP 100.0PF 50V 5%
C549	2113944A40	CAP CER CHP 100.0PF 50V 5%
C550	2113944A40	CAP CER CHP 100.0PF 50V 5%
C551	2113944A40	CAP CER CHP 100.0PF 50V 5%
C552	2113944A84	CAP,FXD,43PF,+5%,-5%,50V-DC,04
C553	2113944A84	CAP,FXD,43PF,+5%,-5%,50V-DC,04
C555	2113944A40	CAP CER CHP 100.0PF 50V 5%
C597	2113944A84	CAP,FXD,43PF,+5%,-5%,50V-DC,04
C598	2113944A17	CAP CER CHP 4.7PF 50V +/-0.25
C599	2113944A15	CAP CER CHP 3.9PF 50V +/-0.25
C600	2113944A81	CAP,FXD,24PF,+5%,-5%,50V-DC,04
C601	2113944A40	CAP CER CHP 100.0PF 50V 5%
C602	2113944A17	CAP CER CHP 4.7PF 50V +/-0.25
CR101	4880973Z02	PIN DIODE
CR102	4815257H01	SURFACE MOUNT PIN DIODES
CR103	4815257H01	SURFACE MOUNT PIN DIODES
CR105	5115022H01	IC TEMPERATURE SENSOR
CR201	4815011H01	DIODE TRIPLE
CR203	4815072H01	DIODE VARACTOR
CR241	4885094Y01	DIODE VARACTOR ISV228 W18
CR242	4885055Y01	DIODE VARACTOR PB-FREE
CR243	4885055Y01	DIODE VARACTOR PB-FREE
CR251	4815322H01	VHF VARIABLE CAPACITANCE DIODE
CR301	4885055Y01	DIODE VARACTOR PB-FREE
CR302	4885055Y01	DIODE VARACTOR PB-FREE
CR303	4815048H01	SOT MMBD353 DIODE DUAL SHT
CR304	4885055Y01	DIODE VARACTOR PB-FREE
CR305	4885055Y01	DIODE VARACTOR PB-FREE

Circuit Ref	Motorola Part No.	Description
CR306	4815923H02	SCHOTTKY DIODE-NEW LEADFREE
CR311	4813974A19	DIODE ARRAY,MXR,SM,SOT-323,7V,
CR312	4815047H01	DIODE,SWG,DAN235EFTL,3 5V
CR313	4815047H01	DIODE,SWG,DAN235EFTL,3 5V
CR501	4815155H01	RECTIFIER
CR503	4805729G49	DIODE RED/YEL
D104	4813825A20	DIODE COMMON ANODE SCHOTTKY BARRIER
E101	2415954H02	INDUCTOR BEAD CHIP EPP WITH EP
E102	7686949J14	FLTR,FERRITE BEAD,2A,SM
E103	7686949J08	FLTR,FERR,1A,SM,0603
E104	7686949J08	FLTR,FERR,1A,SM,0603
E105	7686949J14	FLTR,FERRITE BEAD,2A,SM
F501	6515076H01	FUSE CHIP SMT TR/1608FF 3A
FL201	4805875Z04	CRYSTAL 16.8 MHZ
FL301	9180022M11	XTAL FILTER 44.85MHZ
FL302	9180468V04	SMD455KHZ 4 ELEMENT CER FLTR
FL303	9115811H03	SMD455KHZ 6 ELEMENT
FL304	9115811H01	SMD455KHZ 6 ELEMENT
H101	2680499Z02	HEAT SPREADER
J200	0915064H03	CONNECTOR, ZIF (40 PINS)
L101	2460591B28	COIL AIR WOUND INDUC 13.37
L102	2460591B28	COIL AIR WOUND INDUC 13.37
L104	2460591B48	COIL AIR WOUND INDUC 15.22
L105	2414032B22	IDCTR,WW,390NH,10%,620 MA,1.12O
L106	2460591A19	COIL AIR WOUND INDUC 8.71
L107	2479990G01	AIR WOUND COIL/GREEN COLOR 33.
L108	2479990A01	AIR WOUND COIL/GREEN COLOR 4.2
L112	2414032B42	IDCTR,WW,12NH,5%,1A,.09 OHM,CER
L113	2414017N09	IDCTR,CHIP,5.6NH,600MA,.2 OHM,C
L114	2414032B42	IDCTR,WW,12NH,5%,1A,.09 OHM,CER
L115	2414032B22	IDCTR,WW,390NH,10%,620 MA,1.12O

Circuit Ref	Motorola Part No.	Description
L117	2414017P17	IDCTR,CHIP,22NH,5%,300M A,.88OH
L160	2414017N14	IDCTR,CHIP,15NH,5%,600M A,.4OHM
L201	2414017Q20	IDCTR,FXD,2.2UH,20%,30M A,.65OH
L202	2414017Q20	IDCTR,FXD,2.2UH,20%,30M A,.65OH
L203	2414017Q20	IDCTR,FXD,2.2UH,20%,30M A,.65OH
L232	2414032L25	IDCTR,WW,12UH,5%,150MA, 3.8OHM,
L241	2414032F41	IDCTR,WW,390NH,10%,200 MA,1.5OH
L242	2414032F26	IDCTR,WW,22NH,5%,500MA,.22OHM,
L243	2485776Z02	COIL TEFLON RESONATOR (KAPTON)
L251	2414032F41	IDCTR,WW,390NH,10%,200 MA,1.5OH
L253	2460593C03	COIL MULT LAYERED TAP TEF RESN
L261	2414032F29	IDCTR,WW,39NH,5%,500MA,.29OHM,
L271	2414032F27	IDCTR,FXD,27NH,5%,500MA,.25OHM
L273	2414032F32	IDCTR,WW,68NH,5%,500MA,.38OHM,
L281	2414032F41	IDCTR,WW,390NH,10%,200 MA,1.5OH
L282	2414032F41	IDCTR,WW,390NH,10%,200 MA,1.5OH
L301	2479990B01	AIR WOUND COIL/GREEN COLOR 11.
L302	2479990B01	AIR WOUND COIL/GREEN COLOR 11.
L303	2414032F26	IDCTR,WW,22NH,5%,500MA,.22OHM,
L304	2414032F37	IDCTR,WW,180NH,5%,400M A,.64OHM
L305	2414032F23	IDCTR,WW,12NH,5%,600MA,.15OHM,
L306	2479990B01	AIR WOUND COIL/GREEN COLOR 11.
L307	2479990B01	AIR WOUND COIL/GREEN COLOR 11.
L309	2479990C02	AIR WOUND COIL/GREEN COLOR 16.
L310	2414032F36	IDCTR,WW,150NH,5%,400M A,.56OHM

Circuit Ref	Motorola Part No.	Description
L311	2414017K32	IDCTR,CHIP,560NH,5%,50M A,5OHM,
L321	2414032F37	IDCTR,WW,180NH,5%,400M A,.64OHM
L325	2414032B68	IDCTR,WW,1UH,5%,460MA,1 .75OHM,
L330	2414017K33	IDCTR,CHIP,680NH,5%,50M A,5.5OH
L332	2414015A25	IDCTR,CHIP,1.2UH,2%,440M A,2OHM
L505	2414017Q42	IDCTR,FXD,390NH,10%,200 MA,.65O
P100	3905643V01	CONTACT ANT GRD
PB501	4070354A01	LIGHT TOUCH SWITCH-SMD
PB502	4070354A01	LIGHT TOUCH SWITCH-SMD
PB504	4070354A01	LIGHT TOUCH SWITCH-SMD
PB505	4070354A01	LIGHT TOUCH SWITCH-SMD
Q110	4813976A03	450MHZ 8W 7.5V PLD-1.5 T&R
Q111	4815055H01	TSTR DUAL NPN/PNP UMH 5
Q210	4815055H01	TSTR DUAL NPN/PNP UMH 5
Q241	4805218N63	RF TRANS SOT 323 BFQ67W
Q260	4815055H01	TSTR DUAL NPN/PNP UMH 5
Q261	4815055H01	TSTR DUAL NPN/PNP UMH 5
Q301	4816531H01	NPN SILICON BIPOLAR TRANSISTOR
Q302	4802197J95	RF TRANSISTOR PBR941
Q310	4816531H01	NPN SILICON BIPOLAR TRANSISTOR
Q320	4813973M07	XSTR,BIP GP SS,NPN,TO-236,
Q502	4815154H01	DUAL TRANS NPN
Q505	4813973M07	XSTR,BIP GP SS,NPN,TO-236,
R101	0613952H58	CER CHIP RES 240 OHM 5 0603
R102	0615043C01	POWER METAL STRIP RESISTORS
R104	0613952R17	CER CHIP RES 47K OHM 5% 0402
R106	0613952Q25	CER CHIP RES 10.0 OHM 5 0402

Circuit Ref	Motorola Part No.	Description
R108	0613952Q91	CER CHIP RES 5600 OHM 5 0402
R109	0613952R32	CER CHIP RES 200K OHM 5 0402
R110	0613952Q60	CER CHIP RES 300 OHM 5 0402
R111	0613952Q32	CER CHIP RES 20.0 OHM 5 0402
R112	0613952Q60	CER CHIP RES 300 OHM 5 0402
R120	0613952R16	CER CHIP RES 43K OHM 5 0402
R130	0613952R01	CER CHIP RES 10K OHM 5% 0402
R131	0613952R07	CER CHIP RES 18K OHM 5% 0402
R132	0613952R35	CER CHIP RES 270K OHM 5% 0402
R161	0613952Q56	CER CHIP RES 200 OHM 5 0402
R170	0613952H58	CER CHIP RES 240 OHM 5 0603
R171	0613952R16	CER CHIP RES 43K OHM 5 0402
R172	0613952H49	CER CHIP RES 100 OHM 5% 0603
R173	0613952R31	CER CHIP RES 180K OHM 5% 0402
R174	0613952R17	CER CHIP RES 47K OHM 5% 0402
R175	0613952H12	CER CHIP RES 3.0 OHM 5 0603
R176	0613952H12	CER CHIP RES 3.0 OHM 5 0603
R191	0613958J74	CER CHIP RES 0.0 OHM JMP 0805
R201	0613952R23	CER CHIP RES 82K OHM 5% 0402
R202	0613952R25	CER CHIP RES 100K OHM 5% 0402
R204	0613952R17	CER CHIP RES 47K OHM 5% 0402
R231	0613952Q51	CER CHIP RES 120 OHM 5 0402
R232	0613952Q68	CER CHIP RES 620 OHM 5 0402
R233	0613952Q67	CER CHIP RES 560 OHM 5 0402
R241	0613952Q33	CER CHIP RES 22.0 OHM 5 0402

Circuit Ref	Motorola Part No.	Description
R242	0613952Q51	CER CHIP RES 120 OHM 5 0402
R243	0613952R01	CER CHIP RES 10K OHM 5% 0402
R244	0613952R05	CER CHIP RES 15K OHM 5% 0402
R245	0613952Q58	CER CHIP RES 240 OHM 5 0402
R248	0613952Q36	CER CHIP RES 30.0 OHM 5 0402
R251	0613952Q37	CER CHIP RES 33.0 OHM 5 0402
R252	0613952Q59	CER CHIP RES 270 OHM 5 0402
R253	0613952Q94	CER CHIP RES 7500 OHM 5 0402
R254	0613952Q95	CER CHIP RES 8200 OHM 5 0402
R255	0613952Q82	CER CHIP RES 2400 OHM 5 0402
R256	0613952Q36	CER CHIP RES 30.0 OHM 5 0402
R260	0613952Q73	CER CHIP RES 1000 OHM 5 0402
R301	0613952R25	CER CHIP RES 100K OHM 5% 0402
R302	0613952R25	CER CHIP RES 100K OHM 5% 0402
R303	0613952Q77	CER CHIP RES 1500 OHM 5 0402
R304	0613952R03	CER CHIP RES 12K OHM 5% 0402
R305	0613952Q65	CER CHIP RES 470 OHM 5 0402
R306	0613952R25	CER CHIP RES 100K OHM 5% 0402
R307	0613952R25	CER CHIP RES 100K OHM 5% 0402
R308	0613952Q42	CER CHIP RES 51.0 OHM 5 0402
R309	0613952R66	CER CHIP RES 0.0 +/-0.050 OHM
R311	0613952R13	CER CHIP RES 33K OHM 5% 0402
R312	0613952Q89	CER CHIP RES 4700 OHM 5 0402
R313	0613952Q61	CER CHIP RES 330 OHM 5 0402
R314	0613952Q78	CER CHIP RES 1600 OHM 5 0402

Circuit Ref	Motorola Part No.	Description
R315	0613952R03	CER CHIP RES 12K OHM 5% 0402
R321	0613952R03	CER CHIP RES 12K OHM 5% 0402
R322	0613952Q73	CER CHIP RES 1000 OHM 5 0402
R324	0613952R27	CER CHIP RES 120K OHM 5% 0402
R328	0613952Q11	CER CHIP RES 2.7 OHM 5 0402
R329	0613952R66	CER CHIP RES 0.0 +/-0.050 OHM
R330	0613952R01	CER CHIP RES 10K OHM 5% 0402
R331	0613952Q56	CER CHIP RES 200 OHM 5 0402
R332	0613952R03	CER CHIP RES 12K OHM 5% 0402
R339	0613952Q88	CER CHIP RES 4300 OHM 5 0402
R340	0613952Q95	CER CHIP RES 8200 OHM 5 0402
R342	0613952R25	CER CHIP RES 100K OHM 5% 0402
R344	0613952Q42	CER CHIP RES 51.0 OHM 5 0402
R345	0613952R15	CER CHIP RES 39K OHM 5% 0402
R346	0613952R05	CER CHIP RES 15K OHM 5% 0402
R348	0613952Q86	CER CHIP RES 3600 OHM 5 0402
R349	0613958J74	CER CHIP RES 0.0 OHM JMP 0805
R350	0613952R01	CER CHIP RES 10K OHM 5% 0402
R355	0613952R25	CER CHIP RES 100K OHM 5% 0402
R358	0613952Q73	CER CHIP RES 1000 OHM 5 0402
R360	0613952R08	CER CHIP RES 20K OHM 5 0402
R361	0613952R08	CER CHIP RES 20K OHM 5 0402
R363	0613952Q63	CER CHIP RES 390 OHM 5 0402
R364	0613952Q79	CER CHIP RES 1800 OHM 5 0402
R365	0613952Q75	CER CHIP RES 1200 OHM 5 0402

Circuit Ref	Motorola Part No.	Description
R366	0613952R03	CER CHIP RES 12K OHM 5% 0402
R367	0613952N09	CER CHIP RES 12.1K OHM 1 0402
R368	0613952N01	CER CHIP RES 10.0K OHM 1 0402
R369	0613952Q69	CER CHIP RES 680 OHM 5 0402
R370	0613952R66	CER CHIP RES 0.0 +/-0.050 OHM
R501	0613952Q69	CER CHIP RES 680 OHM 5 0402
R502	0613952Q55	CER CHIP RES 180 OHM 5 0402
R505	0613952R01	CER CHIP RES 10K OHM 5% 0402
R506	0613952R17	CER CHIP RES 47K OHM 5% 0402
R507	0613952R66	CER CHIP RES 0.0 +/-0.050 OHM
R509	0613952R66	CER CHIP RES 0.0 +/-0.050 OHM
R510	0613952R66	CER CHIP RES 0.0 +/-0.050 OHM
S501	4080710Z21	SWITCH, FREQUENCY
S502	1880619Z06	POTENTIOMETER, VOLUME
SH100	2680507Z02	SHIELD, HARMONIC FILTER
SH101	2680510Z02	SHIELD, PA
SH201	2680511Z02	SHIELD, SYNTHESIZER
SH202	2680511Z02	SHIELD, SYNTHESIZER
SH241	2604120G02	AOBA VCO SHIELD
SH242	2680514Z02	SHIELD, VCO BOTTOM/ LVZIF
SH301	2686583Z02	SHIELD, RECEIVER FRONT END TOP
SH302	2680555Z02	SHIELD, RECEIVER F/END BOTTOM
SH303	2680509Z02	SHIELD, MIXER
SH304	2680624Z02	SHIELD, MIXER DIODE
SH322	2686528Z02	SHIELD, IF SECTION
SH323	2615924H01	SHIELD, CRYSTAL FILTER
T301	2515121H01	BALUN, TRANSFORMER W18 COMP
T302	2515121H01	BALUN, TRANSFORMER W18 COMP
U101	5115678H01	VHF/UHF/800/900 MHZ LDMOS DRIV
U102	5185765B26	IC PWR CTRL IN MOS20
U201	5185177Y01	IC TESTED AT25016 48 PIN W18

Circuit Ref	Motorola Part No.	Description
U210	5115266H01	INVERTER TC7ST04FU SS0P5-P-A
U211	5115266H01	INVERTER TC7ST04FU SS0P5-P-A
U241	5105750U56	IC PKG DIE VCO BUFFER
U247	5115026H01	MAX SUPPLY VOL 16V
U248	5115019H01	3.3V REGULATOR IN SOT23-5 PKG
U301	5115281H01	FM IF IC SA616 FROM PHIL-IPS
U302	5115070H01	IC 3-INV LMOS TC7W04FU
VR439	4813977M21	DIODE,ZEN,MBZ5242,SM,S OT-23,12
VR440	4815038H01	ZENER DIODE-6.8V
VR441	4815038H01	ZENER DIODE-6.8V
VR443	4815038H01	ZENER DIODE-6.8V
VR444	4815038H01	ZENER DIODE-6.8V
VR501	4813977M14	DIODE,ZEN,MBZ5235,SM,S OT-23,6.
VR506	4815038H01	ZENER DIODE-6.8V
Y300	4802245J84	XTAL 44.395MHZ, 3RD OT, SMD
Y301	9186145B02	CER.DISCR. CDBCA455CX36-TC
	1485777Z01	INSULATOR (KAPTON)
	2460593C03	COIL MULT LAYERED TAP TEF RESN
	2880658Z08	SMA CONNECTOR

* Motorola Depot Servicing only

** Not Servicable

Notes



MOTOROLA

© 2001-2007 Motorola Inc. All rights reserved.
Motorola Technology Sdn Bhd (Co. No. 455657-H)
Plot 2 Bayan Lepas Technoplex Industrial Park
Mukim 12 S.W.D
11900 Penang, Malaysia

MOTOROLA and the Stylized M Logo are
registered in the U.S. Patent and Trademark Office.
All other product or service names are the property
of their respective owners.

Printed in Malaysia
January 2007



6881094C21-B